

# **EXHIBIT 24**

1 UNITED STATES DISTRICT COURT  
2 SOUTHERN DISTRICT OF NEW YORK

3 FRANKLIN BUONO,  
4 Plaintiff

5 v.

6 POSEIDON AIR SYSTEMS VICTORY  
7 AUTO STORE, INC., VICTORY AUTO  
8 STORES, INC. d/b/a POSEIDON AIR  
9 SYSTEMS WORTHINGTON INDUSTRIES  
10 INC., AND TYCO FIR PRODUCTS LP.  
11 Defendants

Civil Action No.  
7:17-cv-05915-PMH-LMS

12 TYCO FIRE PRODUCTS LP.  
13 Third-Party Plaintiff,

14 v.

15 OPRANDY'S FIRE & SAFETY INC.,  
16 Third-Party Defendant

17 ORAL ZOOM DEPOSITION

DEREK NOLEN

JULY 20, 2020

18 ORAL ZOOM DEPOSITION OF DEREK NOLEN, produced as a  
19 witness at the instance of the Defendant/Third-Party  
20 Plaintiff Tyco Fire Products LP and duly sworn, was taken  
21 in the above-styled and numbered cause on July 20, 2020,  
22 from 9:00 a.m. to 12:20 p.m., before Jill M. Vaughan,  
23 Certified Shorthand Reporter in and for the State of  
24 Texas, reported by computerized stenotype machine. The  
25 witness appeared remotely at 740 E. 13th Street, Houston,  
Texas. The deposition was taken pursuant to the Federal  
Rules of Civil Procedure and the provisions stated on the  
record or attached hereto.

APPEARANCES

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1 THE COURT REPORTER: Today's date is  
2 July 20th, 2020. The time is 9:00 a.m. Central Time.  
3 This is the deposition of Derek Nolen. This  
4 deposition is being conducted remotely by agreement of  
5 the parties or in accordance with the current  
6 Emergency Orders. The witness is located at, 740 E.  
7 13th Street, Houston, TX. My name is Jill Vaughan,  
8 CSR No. 6192 with Veritext. I am administering the  
9 oath and reporting the deposition remotely by  
10 stenographic means.

11 DEREK NOLEN

12 having been first duly sworn, testified as follows:

13 MR. KIRKPATRICK: For the record  
14 James Kirkpatrick on behalf of Tyco Fire Products. We  
15 consent to this deposition being conducted remotely.  
16 And counsel for the other parties also consent for the  
17 record.

18 MR. FROMSON: This is Ken Fromson, I consent  
19 as well.

20 MS. FAPPIANO: Tara Fappiano, I consent as  
21 well.

22 EXAMINATION

23 BY MR. KIRKPATRICK:

24 Q. Thank you, sir. If you could, I know we  
25 just met before; but now that we're on the record

1 could you state your full name and address for the  
2 record.

3 A. Derek Trent Nolen, 740 East 13th Street,  
4 Houston, Texas 7708.

5 Q. And you've testified under oath before,  
6 right?

7 A. Yes, I have.

8 Q. If at any time you don't understand my  
9 question, feel free to please ask to me to clarify.  
10 Otherwise, I'm going to assume that you understand the  
11 question. Does that sound okay?

12 A. Yes.

13 Q. Is there any reason that you can't testify  
14 truthfully today or under the oath that you were just  
15 given?

16 A. No.

17 Q. Separate from the process of preparing your  
18 report, what did you do to prepare for your testimony  
19 today?

20 A. I reviewed some additional materials, some  
21 of the more recent depositions that have come in, gone  
22 back through my report, reviewed some of the materials  
23 that I had previously review and analyzed for the  
24 purposes of preparing my report.

25 Q. Of the additional materials were there any

1 other than the deposition transcripts that you  
2 mentioned?

3 A. I don't believe so.

4 Q. And without obviously revealing any of the  
5 conversations or contents of the conversations, did  
6 you have any conversations with counsel for Oprandy's,  
7 Ms. Fappiano?

8 A. I did, yes.

9 Q. And how many conversations did you have with  
10 her?

11 A. I believe two.

12 Q. When was the first one?

13 A. It would have been July 15th.

14 Q. And how long did that last?

15 A. I believe it was around an hour or less.

16 Q. And when was the second conversation?

17 A. Last Friday, which would have been the 17th,  
18 and that lasted for maybe five minutes.

19 Q. Okay. Was anyone else on the call other  
20 than you and Ms. Fappiano?

21 A. Not that I know of.

22 Q. Have you had conversations with anyone else  
23 other than Ms. Fappiano in preparation for your  
24 deposition?

25 A. No, I have not.

1 Q. So on Exhibit Share, which I understand that  
2 you have open, I have premarked the first four  
3 exhibits. Do you see -- do you see exhibits?

4 A. I see them listed, yes.

5 Q. If you could click on Exhibit 1 for me.

6 (Exhibit 1 marked.)

7 Q. (By Mr. Kirkpatrick) Is this your CV?

8 A. It is.

9 Q. Is it the most updated version of your CV  
10 that you have?

11 A. You know, there may be one more that would  
12 have been done at the end of last year. The only  
13 change would have been additional continuing  
14 education.

15 Q. Okay. And we would ask that you please  
16 provide your -- well, is your updated CV available  
17 online?

18 A. I don't know how we're set up right now.

19 Q. Got it. If you could and I will follow-up  
20 in writing with Ms. Fappiano, but if you could provide  
21 your updated CV to Ms. Fappiano, I'll ask her for it  
22 later.

23 Do you recall the additional  
24 continuing education that would have been added,  
25 like what the name of the courses would be or



1       however you identify it on your CV.

2           A.     I don't recall without looking that up right  
3       now.

4           Q.     Do you remember generally what they  
5       involved, the continuing education?

6           A.     I believe I was again doing some remote  
7       continuing ed which would have been generally just  
8       some engineering -- engineering-related continuing  
9       education. I don't think it was anything specific  
10      that would pertain to this case.

11          Q.     Okay. Did you add anything to your CV  
12      because you were retained for this case?

13          A.     No, I did not.

14          Q.     Or subtract anything?

15          A.     No.

16          Q.     Do you maintain multiple versions of your  
17      CV, or do you just maintain one?

18          A.     There may be two versions. I had -- at one  
19      point I was maintaining two. One that basically had  
20      publications and one that did not.

21          Q.     I believe this version is the one that does  
22      not have publications.

23          A.     I don't see them listed here, correct.

24          Q.     And we ask that when you provide the CV,  
25      that you provide the version of publications. Under

1 the rules I believe the last ten years of publication  
2 are supposed to have been disclosed. So we would  
3 appreciate if you'd send that over.

4 A. I can do that. I don't think there's been  
5 any publications in the last ten years.

6 Q. Okay. That's helpful. So looking at the  
7 overview of your CV or the professional summary, can  
8 you just explain for me what you mean by component  
9 failure analysis?

10 A. Well, generally component failure analysis  
11 can incorporate -- for example, in a system -- a lot  
12 of my work has to do with propane gas systems or gas  
13 systems in general. So components could be piping,  
14 could be regulators, could be valves, could be  
15 appliance control valves. So components of larger  
16 systems. So that's what I'm referring to there.

17 Q. Okay. And so you said your general  
18 application is propane gas systems, but is that  
19 something that can be applied to any system?

20 A. Well, that's not my only, it's just as far  
21 as time-wise I probably spend more doing that -- that  
22 type of case. But, yes, I mean, that's -- again  
23 that's kind of why the component is important because  
24 it can be applied to any pressure source, generally  
25 whether it be propane, natural gas, could be air

1 systems, CO2. CNG, oxygen.

2 Q. And what do you mean by failure mode?

3 A. Failure mode, essentially determining why --  
4 why something failed.

5 Q. Why a system failed, for example?

6 A. Yes.

7 Q. And then what do you mean by -- you have  
8 under experience listed: "With the design and  
9 instrumentation of fire and engineering tests." Can  
10 you just explain what you mean by that?

11 A. Sure, that's more so in the past than  
12 recent, but we've done extensive fire testing is where  
13 that primarily came from. And that was doing  
14 configurations of sometimes full-scale buildings and  
15 conducting full-scale room burns, building burns,  
16 instrumentation that was involved in that in the data  
17 acquisition systems, thermal couples, gas flows,  
18 pressures, pressure sensors. So it has to do with --  
19 in doing a test not only setting up the test, but also  
20 the instrumentation and data acquisition involved in  
21 this test.

22 Q. And you said that was more in the past.  
23 When generally did you do that?

24 A. Well, maybe I shouldn't have said -- the  
25 bulk of testing was more in the past, but we still do

1 testing as cases demand that. It's just not as  
2 frequent at this time. I've done -- we've got testing  
3 going on now to some degree. Testing last year on  
4 liquid propane releases. You know, it's just really  
5 as the case requires it. So it's just we did a lot  
6 more of it in the past. We were -- and I'll just  
7 state, we were involved in -- my company was involved  
8 in the MGM Grand fire back in the Eighties. We did  
9 hundreds of room burns, for example. So it was day in  
10 day out, week over week, so when I say bulk -- and  
11 we've blown apart many structures. So just not so  
12 much any more.

13 Q. Sure. And you mentioned fire testing. The  
14 DOT requires fire testing to test certain -- I guess,  
15 the capacity to certain pressure relief devices. Have  
16 you been involved in fire testing in that context?

17 A. Yes.

18 Q. Of cylinders?

19 A. Yes.

20 Q. When was the last time that you were  
21 involved in such testing?

22 A. It's probably been over five years.

23 Q. Okay. And how many of those tests have you  
24 been involved with over the course of your career?

25 A. Well, again it depends on -- depends on the

1 particular case. We've had 1-pound propane cylinders,  
2 for example, where we've had -- they've been involved  
3 in fires and to the point of testing when the relief  
4 valve activated and the size of fire to the point  
5 where the entire cylinder exploded. We've done -- I  
6 say I've done fire testing with aluminum cylinders,  
7 again propane. So that's some of what I've been  
8 involved with. Where we intentionally -- now, and it  
9 wouldn't necessarily be, you know, for the purpose of  
10 confirming the DOT, but determining kind of what the  
11 capacity of the relief valve is and the propensity  
12 that if a fire is successive, which we've seen in  
13 numerous matters, that you obtain softening of the  
14 steel and other aluminum and blebby actually occurs so  
15 the relief valve is not actually capable of keeping up  
16 with the pressure increase.

17 Q. In terms of those tests where you're testing  
18 the capacity of a relief valve, can you just -- I'm  
19 very novice on this. Can you just explain what you're  
20 looking for when you conduct that test?

21 A. It can vary. Sometimes it could be that the  
22 heat actually causes the relief valve to fail because  
23 of the materials that are involved so that it opens  
24 prior to -- prior to say the actual set pressure  
25 because of destruction of the valve itself. Other

1 times it just a matter of does the relief valve  
2 function, at what pressure does the relief valve  
3 function. So again it's not one specific item, kind  
4 of depends on the case particulars.

5 Q. And in the DOT context, and I understand you  
6 haven't been involved maybe specifically with that,  
7 the point of the test would be to measure flow  
8 capacity of the valve?

9 A. In our testing it's probably more along the  
10 lines of what pressure -- at what point does it  
11 activate and what are the results of it activating.  
12 Again dealing with a flammable gas, of course, you get  
13 a plume escaping from the cylinder. Typically it  
14 lights off if we've got a fire involved. Not always,  
15 but at times. And, of course, you look at the fact  
16 that flame escaping can impinge on other cylinders  
17 causing kind of a cascade effect of fire progression.

18 Q. So just to be clear you have not been  
19 involved in a fire test where the purpose of the test  
20 was to measure the flow capacity of the pressure  
21 relief device?

22 A. Not specifically, no.

23 Q. In terms -- when you say not specifically,  
24 there's situations where you measure flow capacity,  
25 but that's not the purpose? I guess, I'm just

1 wondering what do you mean by that caveat.

2 A. Well, if we're doing a relief valve  
3 activation test with fire, I can't say that we have  
4 been able to instrument the cylinder relief valve and  
5 the -- in a fire environment to actually determine  
6 what the flow rate is escaping from that relief valve  
7 under those conditions. We have done other testing in  
8 the past to attempt to measure, in particular, relief  
9 valves; but that would have been more in the static  
10 pressure application test or over pressurization  
11 without the fire involvement.

12 Q. Okay. And then this last bullet point in  
13 your professional summary is corporate engineering  
14 manager. Can you just describe what you mean by that?

15 A. Well, mainly engineering manager. We've got  
16 one office here, but I oversee the work of our  
17 engineers, fire investigators.

18 Q. At McDowell Owens, is that who --

19 A. (Witness nods head.)

20 Q. And in terms of your employment record,  
21 we'll just start -- we'll do it chronologically and  
22 start with Hydril company. What were your general  
23 responsibilities when you worked there?

24 A. Well, I was an engineering technician at  
25 that time. So I was working on design plans for the

1 facility in the tubular products division for Hydril.  
2 They were expanding their capacity, really all over  
3 the country. My involvement was primarily in the  
4 Louisiana area. And we had a whole lot of plants  
5 under construction at the point that the oil boom  
6 ended back in 1982, so everything kind of dried up.

7 Q. Sure. And is that why you left in November  
8 of '83?

9 A. Yes.

10 Q. While you were at Hydril did you do any  
11 litigation consulting?

12 A. I did not.

13 Q. Was that full time?

14 A. Full-time employment with Hydril, yes.

15 Q. And then you went to Craddock, McDowell &  
16 Crane. Is that the predecessor -- I just noticed  
17 McDowell. Is that the predecessor of McDowell Owens?

18 A. Predecessor of a whole lot of companies.

19 Q. I guess so what is your -- what was your  
20 general responsibility when you worked there?

21 A. I had two, primarily. I was doing accident  
22 reconstruction vehiculars, also doing fire science and  
23 testing so -- and investigations as well at that  
24 point. It was kind of a laboratory testing as well as  
25 that's when we -- I started doing the fire testing



1 configurations. And also continuing my education at  
2 that time.

3 Q. Okay. So you were in school at the same  
4 time?

5 A. Yes.

6 Q. So would you say that was full-time or  
7 part-time?

8 A. More than full time.

9 Q. Didn't sleep much in those years?

10 A. Right.

11 Q. And did you do -- did you do litigation  
12 consulting there?

13 A. I started to, yes.

14 Q. What percentage of time there did you do  
15 litigation consulting?

16 A. Most cases that I was involved with at that  
17 time could have been involved in litigation. Most of  
18 them probably were more just investigative or testing  
19 phases. But again I was -- as we start that time  
20 frame, that was really more of a -- an assistant to  
21 cases, but the cases themselves were -- may or may not  
22 have been involved in litigation. But that would  
23 probably be in, you know, at least, 75, 80 percent,  
24 above what would be just pure testing.

25 Q. Okay. Is the proportion 75, 85 percent for

1 the categories of cases, litigation, prelitigation, is  
2 that the same when you moved to McDowell Owens?

3 A. No. It's probably closer to 95 percent  
4 right now.

5 Q. Has that been the same since you joined in  
6 1986?

7 A. Yes.

8 Q. Other than litigation consulting, what is  
9 the -- what is the other 5 or 10 percent of your time  
10 spent on?

11 A. There is an occasion where we may do work  
12 for a manufacturer that is not specifically litigation  
13 related, testing programs for them. They might want  
14 us to check out certain design changes.

15 Q. Do you have an ownership interest in  
16 McDowell Owens?

17 A. I do not.

18 Q. Do you have other sources of income besides  
19 McDowell Owens? Other than investment accounts.

20 A. No, I do not.

21 Q. Do you have any formal education in thermal  
22 dynamics?

23 A. I do.

24 Q. And when was that?

25 A. That was both my bachelor's and masters

1 degree programs that would have dealt with thermal  
2 dynamic heat transfer.

3 Q. And is that fluid mechanics, same thing?

4 A. Yes.

5 Q. Do you recall when you were first retained  
6 for this case?

7 A. February of 2019.

8 Q. Do you recall who contacted you?

9 A. I believe it was Daniel Rosenberg initially.

10 Q. And you -- have you worked with the law firm  
11 that -- Ms. Fappiano's law firm, Haworth, Barber &  
12 Gerstman before this case?

13 A. I don't believe so.

14 Q. And in back in February 2019, what was your  
15 understanding of your assignment in this case?

16 A. My understanding initially was that there  
17 were materials that were available for me to review  
18 and just consultation with Daniel initially. And I  
19 think we were moving towards -- the last involvement  
20 that I had with Daniel was the testing that occurred  
21 back in May -- is it May of 2019?

22 Q. Yeah.

23 A. And getting prepared for that to understand  
24 what was going to be happening and basically  
25 background and consultation with Daniel.

1           Q.    And did your understanding of your  
2 assignment change after that point?

3           A.    Not so much change, but maybe more refined  
4 in that -- really just an origin/cause aspect of what  
5 actually occurred taking the testimony and putting  
6 together with the physical evidence and coming to an  
7 opinion as far as how this event happened.

8           Q.    Okay. And is that -- so is that  
9 understanding the same understanding you had of your  
10 assignment when you prepared your report?

11          A.    Yes.

12          Q.    Essentially causation analysis?

13          A.    Correct.

14          Q.    And you are, I assume, being paid for your  
15 work in this matter your hourly rate?

16          A.    My company is getting paid my hourly rate.  
17 I'm a salaried employee.

18          Q.    What does your company charge for your time  
19 per hour?

20          A.    I don't recall if this one is set at 275 or  
21 285 per hour rate.

22          Q.    And are those rates different based on the  
23 work you're doing, or is it the year when you were  
24 retained?

25          A.    It's the year. I just don't know exactly

1 when cutoff was that we changed our rates to 285.

2 Q. Do you have different rates for different  
3 types of consulting or is it all the same?

4 A. All the same.

5 Q. About how many hours have you worked on this  
6 case so far?

7 A. I really don't have a good handle on that.  
8 I can -- well, I'm not sure I can pull that up today  
9 or not, but certainly the bulk of it was prior to  
10 preparing the report up to the point of preparing the  
11 report and maybe an estimate in there maybe 40 hours  
12 or less.

13 Q. On everything before the report -- basically  
14 everything up to this point, or is that just for the  
15 report?

16 A. Up to the report anyway.

17 Q. And then how much time do you think you  
18 spent upon the report?

19 A. Well, I'm actually including writing the  
20 report.

21 Q. Okay. And then how much time have you spent  
22 preparing for this deposition?

23 A. Well, reviewing the new materials and going  
24 back over, probably in the order of eight to ten hours  
25 or so.

1 Q. Other than, you know -- other than your  
2 report and things before that, and deposition  
3 preparation, have there been any other significant  
4 chunks of time that you've spent on this case?

5 A. Well, I mean, generally a significant chunk  
6 would have been involved in the testing aspect, of  
7 course, preparing for that, attending the testing and  
8 summarizing that testing with Daniel.

9 (Exhibit 2 marked.)

10 Q. (By Mr. Kirkpatrick) If you could look now  
11 at Exhibit 2. Is this an accurate list of the cases  
12 in which you've given deposition testimony in the  
13 last four years, at least as of July 15th?

14 A. It should be.

15 Q. And then Exhibit 3.

16 (Exhibit 3 marked.)

17 Q. (By Mr. Kirkpatrick) Essentially the same  
18 question for this one. I just want to confirm this  
19 is an updated, accurate list of cases where you've  
20 given trial testimony for the last four years?

21 A. Yes.

22 Q. Do you have an estimate of the number of  
23 times that you've testified at trial over the course  
24 of your career?

25 A. Trial, approximately 25 times.

1 Q. And what about in a deposition?

2 A. Somewhere over 200.

3 Q. And do you have an estimate of the number of  
4 times where you've submitted a written report but not  
5 testified at either deposition or trial?

6 A. Most of the time. I don't have an actual  
7 number, no.

8 Q. But over 50 percent?

9 A. I would say, yes.

10 Q. Have you ever been disqualified as an expert  
11 by a court or had your opinions limited or excluded in  
12 any way?

13 A. No.

14 Q. Let's say over the last ten years in the  
15 course of litigation consulting, do you have an  
16 estimate of the percentage of time that you were doing  
17 work for the plaintiff as opposed to a defendant?

18 A. My work in general or cases that went to  
19 deposition, trial, or how do you want to break that  
20 down?

21 Q. In general.

22 A. 85 percent defendant.

23 Q. Have you been involved in cases that  
24 involved the fire protection industry? And I don't  
25 mean, you know, fire departments or just a fire in

1 general, but basically the businesses that provide the  
2 mitigation -- sorry, let's strike that.

3 Have you been involved in cases --  
4 have you been involved in cases involving the  
5 malfunction or alleged malfunction of equipment used  
6 to suppress fires?

7 A. Yes, in numerous cases I have. I've had  
8 some where I've been involved directly with the  
9 fire -- fire protection companies themselves. I've  
10 done work for them. I've also been peripherally  
11 involved in situations where you might have a  
12 restaurant fire, where I might be working for an  
13 appliance manufacturer or a gas company supplying the  
14 gas and there's also an allegation of suppression  
15 malfunction, such as in a kitchen fire, for example.

16 Q. And what percentage of the cases that you've  
17 worked on would you say involved the fire protection  
18 industry as you just described it?

19 A. Well, over the years it's probably less than  
20 5 percent.

21 Q. And in those cases you're typically doing an  
22 analysis of the cause of a fire; is that right?

23 A. Not necessarily. I mean, I've had, you  
24 know, some suppression systems where it's been a  
25 freeze and a water leak, for example. That would be



1 installation and protection, either provided, not  
2 provided. I've had malfunctions of the systems  
3 themselves; such as a chemical facility where the -- a  
4 particular line was activated and it -- because of the  
5 way it was activated on the drain line, for example,  
6 it spun lose and hit somebody in the head. You know  
7 -- but, no, it's not always fire.

8 Q. In those cases are you analyzing the fire  
9 suppression system itself?

10 A. A lot of times it's the components involved  
11 in the suppression system. Not so much was it put in  
12 and does it properly meet the criteria for covering  
13 fire protection value as far as does it cover the  
14 proper area, but if a sprinkler itself malfunctioned,  
15 why did it malfunction. The installation such that it  
16 may have been hit by some forklift or something  
17 inside. Other, you know, did the -- why didn't the  
18 main valve either activate or why didn't it shut off  
19 when it was supposed to. So again it's down to the  
20 component part as opposed to the entire system  
21 evaluation.

22 Q. Sure. Have you been involved in cases  
23 involving the rupture of a compressed gas cylinder as  
24 in this case?

25 A. Several times. Now when you say as in this

1 case, I think this is the only one I can think of that  
2 was a specific air test cylinder that ruptured, but  
3 I've had numerous cylinders where I've been involved  
4 where for one reason or the other it has been over  
5 pressurized and fails.

6 Q. Do you recall how many cases you had of  
7 those type?

8 A. As far as situations where people were  
9 actually conducting tests, and/or filling, probably 10  
10 or less; but as far as actually failures of cylinders  
11 that may have been involved in fires, probably a  
12 hundred or so.

13 Q. So of those ten cases where there's been a  
14 rupture of a cylinder where people were filling it, do  
15 you recall what cylinders were involved in those  
16 cases?

17 A. I've had CNG cylinders. I think at least  
18 two, two different cases where I had CNG cylinder  
19 failures. And actually I had one more recent that was  
20 actually a -- it was not a DOT specification, but it  
21 was a fabrication designed to be used in Ford trucks  
22 where it was a kind of battery or manifolded machined  
23 aluminum cylinders that were in the design process for  
24 fabrication. And instead of performing hydro tests  
25 with them, they decided to pressure with Argon and

1 they had a significant rupture and factually involved  
2 in that particular matter. So similar cases to that,  
3 kind of special application.

4 Q. Okay. Have you been involved in cases that  
5 do involve DOT styled cylinders?

6 A. Most of the cylinders -- I'm sorry, I maybe  
7 misspoke, but most of the cylinders that have failed  
8 are DOT cylinders that I've been involved with. I was  
9 talking specifically with an air test cylinder when  
10 you indicated like this case.

11 Q. Sure. Okay. Have any of the cases involved  
12 DOT Type 4BW cylinders?

13 A. Again majority of the cylinders are going to  
14 be propane cylinders, and I'm drawing a blank right  
15 now. There's 4BA, 4BW and I just don't recall  
16 exactly; but made to DOT specifications, kind of the  
17 same criteria of fabrication-wise. The difference  
18 would be the product that's actually carried into the  
19 container, which the 4BW can carry many different  
20 types of components. You just have to adjust the  
21 criteria depending on the hazardous material you're  
22 going to be putting in them.

23 Q. Just for my sake when you say fabrication,  
24 can you just explain what you mean by that?

25 A. Material it's made out of and how it's put

1 together, what type of welding process.

2 Q. Okay. So of the cases that you've discussed  
3 -- rather of the cylinders that you've discussed,  
4 those I assume are DOT styled cylinders that have  
5 water capacities of less than a thousand pounds?

6 A. Up to and including, yes, that's correct.

7 Q. Okay. When you are retained to analyses a  
8 cause of an incident, what typically is your  
9 methodology?

10 A. The only time that would vary as far as  
11 using scientific method would be just based on what's  
12 available to do and to look at. Sometimes I'm able to  
13 gather physical scene information myself, documenting  
14 with photographs, measurements; and other times it's  
15 you're kind of fed available material. So it's more  
16 of just a review process, but once the data is  
17 gathered, it's still kind of scientific method, going  
18 through that process to determine what's important,  
19 what's not as far as cause. And trying to put that  
20 together, coming up with different hypothesis for what  
21 may have happened and ruling out those that we can  
22 rule out. That's primarily the methodology that I  
23 would use.

24 Q. And when you said the scientific method, is  
25 that a method that, you know, you could find in a

1 document somewhere?

2 A. Yes. I mean, it's a very common method for  
3 incident investigation. In fact, it's listed in quite  
4 some detail in NFPA 921 which is the investigation of  
5 fire and explosions.

6 Q. And that's the methodology you used in those  
7 cases?

8 A. To the extent it's possible, yes.

9 Q. And if I understood you correctly, the kind  
10 of goal of that methodology is to rule out and rule in  
11 potential causes of an incident?

12 A. Correct.

13 MR. KIRKPATRICK: We're ready for Exhibit 4.

14 (Exhibit 4 marked.)

15 A. Okay.

16 Q. (By Mr. Kirkpatrick) And I just want you  
17 to scroll through and confirm that this is the  
18 report that you've prepared for this case.

19 A. (Witness complies.) It is.

20 Q. Did you write this report yourself?

21 A. I did.

22 Q. Did anybody assist you in writing it?

23 A. No.

24 Q. Did anybody at your firm review your report  
25 after you drafted it?

1           A.     Yes, Eric Benstock would have reviewed the  
2     report for just a peer review.

3           Q.     And the purpose of that is to just confirm  
4     that he agrees with your reasoning and conclusions?

5           A.     Well, not so much to confirm he agrees, but  
6     to be able to raise questions if he doesn't agree.  
7     But, you know, to make sure things are covered as --  
8     as they need to be regarding -- do the statements make  
9     sense even. So it covers both grammatical and  
10    content, just so questions can be asked and  
11    explanation can be given, if necessary.

12          Q.     Do individuals that review reports -- first  
13    of all, let's step back. Is that something y'all do  
14    for each other, so you'll do that for some people,  
15    they'll do it for in terms of reviewing reports?

16          A.     That's correct.

17          Q.     And when you typically review other people's  
18    reports, is that something -- do you add your name to  
19    the report; or it's just something that goes on behind  
20    the scenes?

21          A.     Either/or.

22          Q.     Okay. In what circumstances would you also  
23    sign the report?

24          A.     Well, there's two. Sometimes there could be  
25    a coauthor. Depending on how the report is -- the

1 content of the report, most of the time it's going to  
2 be just reviewed by and in this particular case I  
3 can't tell you why it wasn't.

4 Q. Okay. In most cases it is, though?

5 A. Typically, yes.

6 Q. Now, you mentioned that you reviewed the --  
7 well, let's look at -- well, I'll just ask because  
8 it's not going to be on your list of materials  
9 reviewed. You mentioned that you read the deposition  
10 transcripts of other experts. Do you recall the names  
11 of those experts?

12 A. Yes. Mr. Coelho, Mr. Taranto and let's see,  
13 there's a Juliano.

14 Q. Just those three?

15 A. Hold on a second.

16 Q. You may have reviewed Mr. Hejzler's?

17 A. I did his as well. I'm sorry.

18 Q. No problem.

19 A. I was trying to find my notes.

20 Q. So many experts, it's easy to lose track.  
21 So I understand that you are here as an expert in  
22 engineering; is that right?

23 A. Generally, yes.

24 Q. Is there a different way that you would  
25 phrase what expertise you bring to this case?

1           A.    I think for what I'm doing in the case would  
2   be an engineering aspect. I think that probably would  
3   be an appropriate term for this matter.

4           Q.    Okay. And is it fair to say that you're not  
5   an expert in human factors?

6           A.    I am not an expert in human factors,  
7   correct.

8           Q.    Or human psychology?

9           A.    I am not.

10          Q.    Or occupational safety?

11          A.    Correct.

12          Q.    Or in the design of warning labels?

13          A.    Correct.

14          Q.    Or the design of product manuals?

15          A.    That's correct.

16          Q.    Or in the design of employee training  
17   programs?

18          A.    That would be correct.

19          Q.    Aside from this case in the course of your  
20   professional experience, do you have any experience  
21   with preengineered fire protections systems?

22          A.    Well, as I mentioned you're talking about, I  
23   believe, primarily like the Kitchen Knight 2 system or  
24   1 and others that are -- Ansul and various other  
25   manufacturers. If that's what you're referring to as



1 far as preengineering fire suppression systems, I do  
2 have experience in analysis of them and or various  
3 components as they've been related to cases that I've  
4 been involved with in the past.

5 Q. And what components are those?

6 A. Well, it would be the -- really from the  
7 activation end, you know, analyzing whether or not  
8 such a fusible link may have activated, whether the  
9 system was clogged at the time of the fire, a lot of  
10 those would have been, I think, back in the more  
11 dry-powder-type fixed system; to the cylinders  
12 themselves whether the trigger activation actually  
13 functioned in some that may have been CO2 powered.  
14 And whether or not, for example, safety pins were left  
15 in or not after some testing may have been done such  
16 that the system wasn't actually capable of triggering  
17 a function when it was needed.

18 Q. Have you ever been an authorized distributor  
19 of a preengineered fire suppression system?

20 A. I have not.

21 Q. In the course of your experience with  
22 compressed gas cylinders, have you ever written or  
23 contributed to any publications on that topic?

24 A. You're talking about like a formal change or  
25 suggestion, for example, to either DOT or NFPA?

1 Q. No, I mean more academic publications.

2 A. Only thing would be probably in some --  
3 well, again not a publication, but presentation,  
4 training -- training people in regards to -- with  
5 propane cylinders, for example, because of their  
6 design and DOT criteria, and the fact that they  
7 constantly fall under the DOT requirements that they  
8 have to be requalified, what's involved in the visual  
9 requalification of propane cylinders. So I have, you  
10 know, addressed that in depth in presentations.

11 Q. Have you been involved in any trainings  
12 related to compressed gas cylinders or systems other  
13 than the one that you just described?

14 A. I don't believe so.

15 Q. And you mentioned before, you know,  
16 contributions to NFPA. Have you ever contributed to  
17 industry standards or, you know, DOT regulations with  
18 respect to compressed systems or cylinders?

19 A. I have not individually done that within  
20 NFPA, no.

21 Q. Or DOT?

22 A. I have not.

23 Q. Or the Compressed Gas Association?

24 A. That's correct, I have not.

25 Q. So you mentioned NFPA standards, which NFPA

1 standards do you typically rely on to the extent  
2 they're relevant to your cases?

3 A. Well, it depends on what the case involves.  
4 I mean, obviously in fire investigation over the years  
5 it kind of runs the gamut on all the fire-related,  
6 whether it be oxygen based systems, Life Safety Code,  
7 Electric Code, National Electric Code, Fuel Gas Code,  
8 National LP Gas or Liquefied Petroleum Gas Code and  
9 then fire suppression systems running from 10 to 12,  
10 25, 17, 17(a) and other deluge-type systems. I forget  
11 the numbers. There's quite a few of them, but quite a  
12 bit of NFPA as related to obviously fire in general,  
13 but I've covered quite a few of those different  
14 standards, codes.

15 Q. Okay. Do you often rely on the standard in  
16 NFPA 55, which is the standard for the storage use and  
17 handling of compressed gaskets?

18 A. That's not one that would be frequent, but  
19 as-needed.

20 Q. Do you have experience dealing with fire  
21 codes?

22 A. Yes, I do.

23 Q. Can you just kind of generally explain what  
24 typically you use fire codes for in your work?

25 MS. FAPPIANO: Note my objection.

1           A.     The primary purpose of what I would use fire  
2 codes would be to determine whether or not there is a  
3 more specific requirement in any particular state,  
4 determine what, for example -- I also do work with  
5 carbon monoxide, whether or not a -- so I've looked at  
6 local fire codes where there may be a specific  
7 requirement for installation of carbon monoxide  
8 detectors in a commercial establishment.

9                     So that's the primary reason that I  
10 would use fire codes is, you know, above and beyond  
11 what would be addressed in NFPA codes I would  
12 typically be looking at is there something specific  
13 in that local jurisdiction.

14           Q.     (By Mr. Kirkpatrick) In the course of your  
15 professional experience have you relied upon OSHA  
16 standards in forming any of your opinions?

17           A.     At times, yes.

18           Q.     In what context?

19           A.     Quite a variety there. OSHA standards, for  
20 example, odorization and filling of a propane  
21 cylinder, there are OSHA standards for, I believe,  
22 filling of compressed gas cylinders. And, you know, I  
23 get into some other aspects of OSHA requirements for  
24 general workplace safety. That's not a key area of  
25 mine, but I do have some instances where that's --

1 where that comes into play, at least regarding what  
2 the OSHA standards say for a particular application.

3 Q. And in the course of your professional  
4 experience, have you relied on CGA standards?

5 A. Yes.

6 Q. Which standards?

7 A. Well, the standards -- well, again naming  
8 actual numbers off, some of the ones on relief valves.  
9 I rely on the CGA standards for the type of  
10 connections, the specifications for connections, for  
11 cylinders, like I said relief valve operation and  
12 testing, which also covers the UL standards as well.  
13 CGA as far as P-1 standard. There's probably several  
14 others; but yeah, I'm very familiar with CGA  
15 application.

16 Q. In your report you cite various regulations  
17 and standards including NFPA. Of the regulations and  
18 industry standards that you cite, do you believe that  
19 any of those standards are ambiguous?

20 MS. FAPPIANO: Note my objection to form.

21 Q. (By Mr. Kirkpatrick) And I'll clarify,  
22 with regard to this case, not anywhere. Let me  
23 rephrase it.

24 The standards and regulations that  
25 you cite including the NFPA, do you believe that any

1 of those require engineering expertise to  
2 understand?

3 A. I think they're fairly straightforward. You  
4 know, the general application of them is quite  
5 specific. You know, generally that's the way NFPA  
6 sets up their standards. You have one that applies to  
7 in this case, 17(a) standard for wet chemical  
8 extinguishing systems, that's primarily what it  
9 applies to. However they also incorporate and  
10 reference many other standards that are equally  
11 important in their own right, but -- and possibly  
12 necessary in order to comply with all of the  
13 particular standards for, say, the installation,  
14 maintenance and recharging, for example, of wet  
15 chemical extinguishing systems.

16 Q. In terms of how those -- I'm not just  
17 talking NFPA standards, but any other standards you  
18 considered in analyzing this case, with respect to  
19 those standards in particular, do any of those require  
20 engineering expertise to understand?

21 MS. FAPPIANO: Note my objection to the  
22 form. You can go ahead.

23 A. Well, I mean, they're not -- they're not  
24 really intended for general public. I mean, if you're  
25 a manufacturer, for example, as they would be applied,

1 again wet chemical extinguishing systems, the general  
2 public can't read that and put together a system. I,  
3 mean, it is a -- somebody who is working with or on,  
4 that may involve an engineering expertise to some  
5 degree. So the application I would say that there is  
6 an engineering component in applying these.

7 Q. (By Mr. Kirkpatrick) Sure. And I  
8 understand that with respect to manufacturing, but I  
9 just mean in terms of any standards that you apply  
10 in this case to these facts, are any of those  
11 ambiguous such that it takes an engineer to  
12 understand what they require?

13 MS. FAPPIANO: Objection to form.

14 A. Possibly. I think the interpretation and  
15 overlapping of some of them is -- like the CFRs are  
16 quite a challenge sometimes to extract what's actually  
17 being said and what's required and how it actually  
18 applies in that particular circumstance. And also  
19 NFPA can be the same way. You can find -- I do --  
20 it's like a -- like a hunt to get to the bottom of  
21 some of the references, and did you -- you know, the  
22 understanding of the applications. So I think it  
23 takes somebody with some expertise and understanding,  
24 whether that be an engineer or somebody in the  
25 industry to fully acknowledge and accept what's

1 actually required.

2 Q. (By Mr. Kirkpatrick) Okay. Have you ever  
3 designed a product that's been sold in commerce?

4 A. I have not.

5 Q. Have you ever designed a compressed air  
6 system?

7 A. Well, I don't know -- I was involved in the  
8 design of a compressed air system or putting together  
9 systems back at Hydril, what was necessary, kind of  
10 specing items out, so that part of design. But to say  
11 that, you know, anybody would sit and design from the  
12 ground up a compressed air system, no; putting  
13 component parts together in and what is necessary for  
14 a particular application, yes.

15 Q. What types of systems were you involved with  
16 designing at Hydril?

17 A. They had fairly high demand. So inspecting  
18 compressor, dryers, regulators, valves, piping  
19 systems.

20 Q. And for what application?

21 A. More of a demand for the -- there were a lot  
22 of the pneumatic actuators that were involved in  
23 moving -- moving tubular products, whether they be in  
24 rack systems or clamping applications.

25 Q. And just to -- for my lay perspective, what



1 do you mean by -- can you just elaborate a little bit  
2 more on the applications what you mean. I know you  
3 said pneumatic actuators and moving tubular products.

4 A. They had rack systems, for example, where  
5 you might have pipe laid on a flat rack. In order to  
6 move the next pipe along into the conveyor system, you  
7 would have an actuator that would actually tilt up and  
8 push the next pipe over into kind of a conveyor  
9 system. You also have -- when you're actually doing  
10 operations on them, you would have possible clamping  
11 applications where a pipe would be held and some  
12 machine process maybe completed.

13 Q. So in large industrial context?

14 A. In that particular application, yes.

15 Q. Were there other types of compressed air  
16 systems that you were involved with other than at  
17 Hydril other than what you just said?

18 A. That's the primary one at Hydril, that type  
19 of system.

20 Q. Have you ever been involved in the  
21 manufacture of compressed air cylinders?

22 A. The actual cylinders, no. And the answer  
23 probably holds true if you're saying compressed air  
24 specifically as opposed to cylinders that could be  
25 used for many different applications.

1 Q. Sure, let's say either one, either category.

2 A. Not specifically involved in any design or  
3 manufacturer of them, correct.

4 Q. In forming your opinion in this case, did  
5 you study other test tanks for preengineered fire  
6 suppression systems?

7 A. I can't say that I did.

8 Q. Did you study any other DOT 4BW style tanks?

9 A. I did not.

10 Q. Or any tanks in general?

11 A. Well, for this case, no.

12 MR. KIRKPATRICK: I think now is a really  
13 good time for a quick five-minute break, if that works  
14 for everybody else.

15 THE WITNESS: Sure.

16 MR. KIRKPATRICK: Why don't we come back at  
17 11:05.

18 (Recess taken)

19 Q. (By Mr. Kirkpatrick) Mr. Nolen, I want to  
20 now look at your report, which is Exhibit 4. First  
21 of all, starting with the first paragraph of the  
22 report, you state that you -- or rather that your  
23 firm has completed a preliminary engineering  
24 analysis and this summarizes your findings to date.  
25 Do you plan to submit any further analyses in this

1 case?

2 A. I don't have any plans to do so at this  
3 time.

4 Q. So when you say it's a preliminary  
5 engineering analysis, does that have any meaning as  
6 opposed to final engineering analysis?

7 A. It only recognizes the possibility there may  
8 be other topics that arise or opinions that arise that  
9 I might need to consider or be involved in a  
10 rebuttal-type commentary, if necessary, as the  
11 discovery continues.

12 Q. Okay. And page 2 of your report is the list  
13 of the materials that you considered. Are you relying  
14 on anything that's not listed in your -- in this list  
15 for your opinions?

16 A. Well, as we sit today, I'm obviously -- I  
17 would incorporate the additional depositions and other  
18 maybe references that have been mentioned within those  
19 depositions that I have reviewed in preparing for the  
20 deposition today. But with respect to what I relied  
21 on at the time of my report, I wouldn't add anything  
22 else to that, no.

23 Q. Are there any treatises that you rely on to  
24 form your opinions in this case?

25 A. None that I can think of specifically, no.

1 Q. Or any other reference materials?

2 A. Not for the purpose of the report.

3 Q. And did you read all of the materials that  
4 are listed here?

5 A. Yes.

6 Q. And your expert disclosure, this report  
7 identifies all the opinions that you plan to offer at  
8 trial, right?

9 A. I think in a general sense, yes. I mean,  
10 there may be some tangential opinions that could arise  
11 from the specific -- I mean, this kind of categorizes  
12 my primary focus in this case.

13 Q. This being your report?

14 A. Yes. And those opinion that are stated  
15 therein.

16 Q. So there are opinions that you may offer at  
17 trial that are not set forth in this report?

18 A. Only to the degree that if somebody else has  
19 an opinion along the lines of what I've specified, I  
20 may have a different opinion. I guess what I'm saying  
21 is there could be some different wording and/or  
22 corporations or opinions about other's opinions, but  
23 this is the general area in which I am kind of  
24 confining myself with respect to this case.

25 Q. So any opinion that's not in this report, I

1 just want to make sure I'm totally clear on this,  
2 would be in response to something someone else said  
3 that was not contained in their report. Do I have  
4 that right?

5 A. Or stated within their deposition, for  
6 example.

7 Q. Right. Okay.

8 A. Yes.

9 Q. Yes, okay. And this report sets forth the  
10 basis and reasons for your opinions, right?

11 A. Yes, it does.

12 Q. And the facts and data that you considered  
13 in forming them?

14 A. Yes.

15 Q. Have you conducted any analyses in this case  
16 that are not reflected in this report?

17 A. I don't believe.

18 Q. Or any tests?

19 A. I think everything that I've done in  
20 preparation for the report is reflected to some degree  
21 within the report itself.

22 Q. Do you have any intention of conducting any  
23 other analyses or tests in this case?

24 A. Not at this time, no.

25 Q. In your -- in the course of your preparing

1 either for this report or for the deposition, have you  
2 taken any notes?

3 A. Sure. I took notes from the very beginning  
4 as far as reviewing materials, OSHA reports and looks  
5 like primarily depositions.

6 Q. And do you have all those notes still?

7 A. I do.

8 Q. I just ask that you preserve those notes  
9 because we may be asking Ms. Fappiano for a copy of  
10 them.

11 Generally speaking do you understand  
12 that you are testifying as a rebuttal expert?

13 A. I do.

14 Q. Whose opinions do you understand that you're  
15 rebutting?

16 A. Well, I don't know if I've got a specific  
17 list of who I'm rebutting. I think it is a  
18 combination of reviewing the factual information and  
19 my interpretation and analysis of that factual  
20 information as it relates to this case, which may or  
21 may not rebut some of Tyco's named experts and in some  
22 cases potentially Mr. Taranto, depending on the  
23 specific area of discussion.

24 Q. And just so I'm clear, as you are looking  
25 off to the side, are you just looking at your report

1 when you do?

2 A. I am.

3 Q. I just want to make sure that we're on the  
4 same page on that.

5 A. I've got two screens. So that's -- I've got  
6 this one setup just for the video purpose.

7 Q. Yeah, I got the same thing going on.

8 So if I understand you correctly some  
9 of your opinions may be rebutting either Tyco or  
10 plaintiff's experts, but others are just your  
11 opinions on the factual information that you've  
12 reviewed?

13 A. Yes.

14 Q. Now, if we look at -- I'm on page 1 and I  
15 guess jumping back, and I'll try to go in order but  
16 clearly I've obviously failed. So just let me know  
17 when if you're not sure what I'm talking about at any  
18 point.

19 A. Okay.

20 Q. This background section, this is the part of  
21 your report where you summarize your understanding of  
22 the relevant facts in this case; is that right?

23 A. Yes, briefly.

24 Q. Yes, sure. And that's based on reviewing  
25 material in this case?

1           A.     Right, a combination of Brian Scott's  
2     deposition, as well as OSHA report I think primarily.

3           Q.     Have you reviewed -- I'm on page 2 now. You  
4     reviewed also the deposition of several other  
5     individuals; Daniel Truex, Emily Fonseca, et cetera,  
6     et cetera?

7           A.     Yes.

8           Q.     Now, moving to page 3, is it your  
9     understanding that the subject tank that suffered the  
10    rupture was a DOT approved 4BW type cylinder?

11          A.     That's my understanding, yes.

12          Q.     And you don't have any opinion that the tank  
13    failed to meet DOT requirements, do you?

14          A.     I do not.

15          Q.     You discuss this Tyco wet valve. Do you  
16    know who designed the Tyco wet valve?

17          A.     I have no information on that valve other  
18    than Tyco literature. So beyond that, no.

19          Q.     And based on your review of that literature,  
20    you don't know one way or another who designed it?

21          A.     You kind of broke up a little bit, but I  
22    think -- I don't have anything beyond the Tyco  
23    literature.

24          Q.     And based on your review of that literature  
25    you don't know one way or other whether Tyco or



1 somebody else designed it?

2 A. That's correct.

3 Q. Okay. Still on page 3. You state that the  
4 air test tank is virtually identical to Tyco's  
5 extinguishing agent cylinders minus the dip tube and  
6 identification label, as well as painted green over  
7 red. What is the purpose of a dip tube?

8 A. Well, as this cylinder would be installed, a  
9 vertical orientation, the liquid is going to settle  
10 towards the bottom of the container, depending on how  
11 much liquid agent is in the specific container and the  
12 air pressure is going to be on top. So it's  
13 essentially like a straw in pressurizing the vessel.  
14 In order to get the bulk of the liquid out of the  
15 container, there has to be a dip tube in the bottom  
16 which allows for drawing the majority of the liquid.

17 Q. What do you mean by an identification label?

18 A. It's my understanding that in the agent  
19 cylinders, they actually have kind of a data plate  
20 identification label on them that calls out what they  
21 contain and their purpose and their model number, for  
22 example.

23 Q. Okay. And that's based on your review of  
24 the record in this case?

25 A. Yes.

1           Q.    Do you agree that the test tank is a low  
2   pressure tank?

3           A.    In general, yes.

4           Q.    What would you consider to be kind of the  
5   cutoff between high and low pressure?

6           A.    Really depends on an application as far as  
7   cylinders go.  I've seen the reference of 500-psi.  In  
8   other applications I've seen it be a thousand.  But  
9   then again, you know, high pressure systems, could  
10   be -- as far as operation of gaskets in general, could  
11   be 20-psi and above.  So it really is application  
12   specific and depending on what the end use is.  So in  
13   general I would go with the anything under 500 would  
14   be a lower pressure in general.

15          Q.    Are any of the -- I'm referencing on page 3,  
16   you say:  "Air cylinder sold for use with Tyco Kitchen  
17   Knight Restaurant Fire Suppression System."  I'm not  
18   sure whether you're aware, there are two different  
19   types of Kitchen Knight systems; Kitchen Knight 1 and  
20   Kitchen Knight 2.  Are any of your opinions specific  
21   to one system as opposed to the other?

22          A.    No.

23          Q.    In selecting a regulator for a -- and I'll  
24   strike that.  I'm moving to page 4 now, but not  
25   referencing anything specific in your report.

1                   In selecting a regulator for a  
2                   compressed gas system, do you believe that it's  
3                   important for users of the system to consider the  
4                   specific gas that's going to be involved?

5                   A.     Yes.

6                   Q.     And the operating pressures involved in that  
7                   system?

8                   A.     Yes.

9                   Q.     And range of delivering pressures that are  
10                  needed in that system?

11                  A.     Yes.

12                  Q.     And the degree of accuracy of the delivery  
13                  pressure needed from the system?

14                  A.     Yes.

15                  Q.     And the appropriate flow rate in the system?

16                  A.     Yes, sure. Depending on the application,  
17                  that's important.

18                  Q.     Do you believe it is appropriate for a user  
19                  of compressed gas system to consider the cost of the  
20                  regulator in its choice of regulators for the system?

21                  A.     I think that's a factor that may come into  
22                  play, sure.

23                  Q.     So you're not saying it's inappropriate to  
24                  consider costs?

25                  A.     No.

1           Q.    Do you understand that the Poseidon system,  
2           which you described on page 4, was used to fill FTPA  
3           tanks?

4           A.    I know that's one of its applications, yes.

5           Q.    And do you agree that in filling a low  
6           pressure cylinder, it's best practice to incorporate a  
7           low pressure regulator?

8           A.    Not necessarily, as long as the regulator  
9           that you're using is adjustable to provide a pressure  
10          that's adequate for the end use.

11          Q.    Do you think regardless of the precision of  
12          the regulator, so long as it is capable of providing  
13          pressure at rates that are appropriate for the low  
14          pressure cylinder, that's an acceptable regulator?

15          A.    I believe so, yes, for this application of  
16          merely transfilling, you don't have a -- a really  
17          tight requirement for one constant flow rate demand on  
18          the end use, speed of application. It's merely what  
19          kind of pressure can you set for the output of that  
20          regulator, is it -- is it compatible and controllable  
21          to that range of what's needed to fill the end use  
22          cylinder. It would be different if you had a demand  
23          under constant flow or needing to maintain a real  
24          tight, you know, narrow window of constant use.

25          Q.    Do you agree that it is important to

1 calibrate your regulator periodically if you own a  
2 compressed gas system?

3 A. I haven't seen anything that requires  
4 calibration of a regulator. I know gauges are  
5 typically needed to be looked at for calibration  
6 purposes or at least a comparison of the output  
7 because things can happen to them. They can -- they  
8 can be sprung, they can get some hysteresis, you know,  
9 and not provide the accurate range of pressure that's  
10 required.

11 Q. Okay. And that responsibility for  
12 calibration is the owner of the systems, right?

13 A. Generally I think that would be the  
14 understanding, sure. Yeah, the owner would be the one  
15 -- owner/user of the system would want to make sure  
16 it's functioning within the specification.

17 Q. The way that Oprandy had this system set up,  
18 there was no relief valve installed on the outlet side  
19 of the regulator; is that right?

20 A. That's correct, nor was there one required.

21 Q. And it's not -- in your report in your  
22 opinions you don't recommend that there should have  
23 been a relief valve installed at the outlet side of  
24 the regulator?

25 A. That's correct, because the system that was

1 providing the outlet pressure was -- had the capacity  
2 to handle the outlet pressure.

3 Q. And you agree that a relief valve -- you can  
4 have a relief valve on the output side of the  
5 regulator that would prevent rupture of, let's say, a  
6 cylinder based on where you set the psi. It would be  
7 possible to do that, right?

8 A. Are you saying --

9 MS. FAPPIANO: Object to form.

10 THE WITNESS: I'm sorry.

11 MS. FAPPIANO: Go ahead.

12 A. Are you saying that it's possible to install  
13 an adjustable relief valve?

14 Q. (By Mr. Kirkpatrick) Yes, that's my  
15 question.

16 A. That's generally frowned upon, an adjustable  
17 relief valve. Generally you want to set a relief  
18 valve for the application which it's installed. Most  
19 cases where you have an adjustable relief valve it is  
20 adjusted specifically for that application --

21 Q. Okay.

22 A. -- and then locked in position. In this  
23 instance, you know, the relief valve again also  
24 protects the transfer system is what you're talking  
25 about here. So the hoses were obviously rated up to

1 at least 6,000-psi. So that would be, you know, close  
2 to the setpoint of your relief valve.

3 Q. And why do you say that the hoses were rated  
4 to at least 6,000-psi?

5 A. Well, the hoses were in application for  
6 transfilling. As I understand it, the NFPA cylinders,  
7 they used the same hose for doing so, and in that case  
8 they would have to be rated to that pressure.

9 Q. So you're saying that under the regulations  
10 or industry standards, they should have been rated to  
11 6,000-psi but not necessarily that they were in this  
12 case?

13 MS. FAPPIANO: Objection to form.

14 A. Well, one -- the hoses that was presented  
15 that I looked at was a Parker parflex 5,000-psi G  
16 hose. So, yes, they were.

17 Q. (By Mr. Kirkpatrick) Okay. And did you  
18 inspect the cascade system?

19 A. I did not.

20 Q. You don't know what the pressure in this  
21 cascade cylinder was at the time of the accident, do  
22 you?

23 A. All I know it's something less than  
24 4500-psi.

25 Q. But how much lower than 4500-psi you are not

1 sure?

2 A. I don't believe that was documented.

3 Q. So, yeah, we're still on page 4. You said  
4 that the pressure in the manifold cylinders was likely  
5 well below 4500-psi; and the basis for that is because  
6 it had been used to fill other cylinders, right?

7 A. That's my understanding. So we're, what,  
8 about six months of use, looks like, potential use  
9 from the 4500.

10 Q. And what is the significance of that  
11 sentence for you?

12 MS. FAPPIANO: Objection to the form.

13 A. Which sentence?

14 Q. (By Mr. Kirkpatrick) The final sentence of  
15 the first paragraph on page 4, so: "As the  
16 cylinders recharged other cylinders since being  
17 filled and the compressor was not connected, the  
18 pressure in the four manifold cylinders was likely  
19 below 4500 psi."

20 A. There -- well, one, it sets a -- kind of a  
21 maximum level that we're working from here as well as  
22 the fact that during regulator testing that occurred  
23 in May, no testing was done of the regulator other  
24 than to show that it appeared to be in a maximum  
25 pressure application. And I believe that the pressure



1 that was done went up to 6,000-psi. So the importance  
2 of 4500 is it may have been adjusted at the time of  
3 our testing, essentially wide open; but it could not  
4 have been passing 6,000-psi based on the cylinders.

5 Q. Okay. Regarding the regulator that was  
6 attached to outlet of the Poseidon manifold, you  
7 believe that the regulator was an Aqua Environment  
8 Model 415-5000?

9 A. Well, I believe it's very much similar to  
10 that. There was either a lack of labeling and or  
11 stamping that did not call out exactly what that  
12 regulator was.

13 Q. So you are not totally sure, but are you  
14 reasonably certain that that's the type of regulator  
15 it was?

16 A. Everything that I've been able to look at  
17 dimensionally and from a capacity standpoint and the  
18 exemplar regulator that was presented, at this point  
19 with what I have, that's the closest I could come to  
20 identification.

21 Q. So you had not seen any other regulator that  
22 was more similar to the regulator than an Aqua  
23 Environment 415-5000?

24 A. Not based on specifications that I reviewed  
25 on their website as far as the data and the different

1 styles and dimensions and pressure output of the  
2 regulators, no.

3 Q. Is that a single-stage regulator?

4 A. I believe it is.

5 Q. And generally what is the difference between  
6 a single-stage regulator and a two-stage regulator?

7 A. In general, a two-stage, you actually have  
8 two steps that occur. You have a pressure that drops  
9 or reduces the pressure from the cylinder pressure  
10 down to a reduced pressure. The most common  
11 application of that type of regulator is in gas  
12 systems where you have a high pressure -- high  
13 pressure regulator and tank, which will take tank  
14 pressure and drop it down to, say, 10 psi.

15 Then you might have -- I mean, you  
16 would have a secondary regulator or a third  
17 regulator, depending on application, to control the  
18 pressure to what would be used within a residential  
19 or industrial application that's going to be -- that  
20 just allows for more tight control because you have  
21 flow conditions and the need to maintain kind of a  
22 constant pressure as opposed to having variations of  
23 fluctuations that can occur with just merely a  
24 single stage.

25 Q. Do you think that it's best practice to use

1 a two-stage regulator when you are using a high  
2 pressure source to fill a low pressure cylinder?

3 A. Not necessarily. As long as -- I think I  
4 stated before, as long as you have the capability of  
5 adjusting the regulator to a useable range for the  
6 application, it's sufficient. If you need tight  
7 control for a constant flow rate at a low pressure,  
8 then the consideration of a two-stage would be  
9 appropriate because you can get -- between flow and no  
10 flow conditions, you can get a lot more variability in  
11 a single-stage application.

12 Q. So you mentioned the acceptable level of  
13 control. What did you mean by that?

14 A. Well, again back to my example of using gas  
15 for your residence. You -- the two-stage system there  
16 allows you to have more tight control over what  
17 pressure is going to an appliance control valve that  
18 is going to only have, say, a maximum pressure rating  
19 of 1-1/2-psi inlet. And if you have situations that  
20 occur with these control valves where they're opening  
21 and closing sometimes very rapidly, you can get a  
22 pressure spike if you don't have a tighter control  
23 over what that outlet pressure is and damage the --  
24 the control valve. If you're merely -- you know,  
25 essentially filling a container and you set the

1 pressure for the pressure that's needed to fill a  
2 container, once the container is filled, it's a matter  
3 of closing the valve, you stop the operation. And in  
4 a tight control it's not that significant.

5 Q. Is there any downside to using a two-stage  
6 regulator or is it just costs?

7 MS. FAPPIANO: Objection.

8 A. I think it's -- it depends on frequent --

9 THE WITNESS: I'm sorry, did I jump in on  
10 top of somebody?

11 MS. FAPPIANO: That's okay. I think the  
12 court reporter got my objection.

13 A. It really depends on your application and a  
14 -- it could go to convenience. It could go to  
15 necessity. If you're using -- if your capability is  
16 to use this regulator to fill STBAs and then to adjust  
17 it down to fill lower pressure cylinders, a two-stage  
18 may be cumbersome in the sense that you may not be  
19 able to properly fill your STBA with the two-stage  
20 because of the higher pressure required to fill that  
21 cylinder.

22 Q. (By Mr. Kirkpatrick) And what do you mean  
23 by -- what would make it cumbersome?

24 A. More adjustments necessary and/or complete  
25 replacement of that regulator with a second regulator

1 depending on the application.

2 Q. So what do you mean by a complete  
3 replacement of the regulator? When would that be  
4 required?

5 A. If the two-stage was not adjustable  
6 necessarily up to the pressure needed for the STBA,  
7 you may have to remove that two-stage regulator and  
8 apply a different regulator that is capable of  
9 providing the necessary pressure for the STBA  
10 application.

11 Q. And when you said more adjustments would be  
12 needed, you mean because you needed to adjust both --  
13 both sides of the regulator?

14 A. That would be my opinion, yes. That may be  
15 necessary on the two-stage because if you're dropping  
16 down to, say, 500-psi on your first step, then in  
17 order to do the STBA, you either have to be able to  
18 adjust that pressure back up to the tune of 5,000 or  
19 4500, whichever it may be, or you have to take that  
20 regulator out of the system.

21 Q. Okay. On page 4 when you discuss -- the  
22 second area you discuss is the wet valve and you say  
23 the wet valve is unique. Unique in relation to what?

24 A. Most other valves.

25 Q. And it's unique because there was no

1 handwheel or other device to be rotated?

2 A. Right. I mean, your typical valve as people  
3 would be familiar with valves have something that  
4 typically turns or slides to activate the opening and  
5 closing of the valve.

6 Q. Okay. So have you never seen another valve  
7 that doesn't contain -- sorry, that's a double  
8 negative.

9 Have all other wet valves that you've  
10 seen had either a handwheel or some other device  
11 that can be rotated?

12 A. No. I'm just talking valves in general.  
13 For this application it's not necessarily unique. I'm  
14 referring to specifically valves in general.

15 Q. Okay.

16 A. A valve on the cylinder, for example,  
17 between your -- your cascade system would have a  
18 handwheel, and your STBA cylinder would likely have a  
19 handwheel as well.

20 Q. So the wet valve that was on the test tank  
21 is not unique to other tanks of a similar size that  
22 you've come across in your career?

23 A. Not for the application which is (audio  
24 dropout)

25 Q. Which is?

1           A.     Well, fire suppression, that condition.

2           Q.     Why might one have a wet valve without, you  
3 know, something that rotates? Is there a reason for  
4 that?

5                   MS. FAPPIANO: Objection to form.

6           A.     It really goes to system design of the  
7 compression system. It enables the placement of the  
8 cylinder into operation, meaning the -- the agent's  
9 cylinder into operation without actually pressuring  
10 any part of the system prior to the need for it to be  
11 pressurized. So it can be installed and removed as  
12 needed for testing of the system. That's one benefit  
13 of not having a handwheel, plus the fact that  
14 automation of the system from an outside pressure  
15 source which is needed to activate the system.

16          Q.     (By Mr. Kirkpatrick) Same paragraph you  
17 state: "This design allows three slightly different  
18 ways that pressure can be introduced through the  
19 valve endings of the attached cylinder." Am I right  
20 that the method that you would use depends on how  
21 the system is set up, the compressed gas system?

22          A.     To some degree, yes.

23          Q.     And for, I'm not sure if it was one or two  
24 of these methods, you state that you need a recharge  
25 adapter kit.

1           A.     Well, the connection of refilling as I  
2 understand it would be to remove the regulator from  
3 the inlet/outlet of the valve and put a recharge  
4 adapter into -- in place of the regulator in order to  
5 charge it -- charge the cylinder.

6           Q.     And you say it's sold separately. Is that  
7 something that manufacturers of the tank would sell or  
8 is that something you buy, you know, somewhere else?

9           A.     I believe it's a part that's listed, again,  
10 on the parts list, the Tyco parts list. I think I  
11 call out a -- I thought I did. I thought I called out  
12 a number in the report, maybe I didn't.

13          Q.     Is that something that you would think they  
14 would sell?

15          A.     Yes.

16          Q.     And is that consistent with other fire  
17 suppression systems, that they sell charge adapter  
18 kits and you buy them separately?

19          A.     I don't know that.

20          Q.     And I believe that -- so Method 3 I believe  
21 you -- well, actually strike that. Nevermind.

22                   Do you need -- sorry, strike that.

23                   Do you need the adapter kit to refill  
24 the tank, period, or only to use for particular  
25 methods to refill the tank?



1           A.     I'm not sure that distinction is clear to  
2     me.   If you have -- if you have the regulator  
3     installed, you can introduce a revision into potential  
4     -- potential flow whereas -- because there's a very  
5     tight interference between the -- let's see, let me  
6     look at my report real quick.   I'm getting the terms.  
7     They call it between the seal and the screw, No. 13  
8     and 14.   You remove some of that restriction by using  
9     the recharge adapter by taking the regulator component  
10    out.   It comes through the regulator component.

11          Q.     When you say restriction, what do you mean  
12    by that?

13          A.     It's just generally the way a regulator  
14    functions.   There's interference between the seal and  
15    the -- I have actually the regulator here.   There's a  
16    very small opening, and the way that seal fits into  
17    the regulator it actually as air -- actually as flow  
18    comes out of the cylinder, there is a movement against  
19    the inner seal and springs, which adjusts how rapidly  
20    and what outlet pressure is capable of coming out.   So  
21    to some degree there's still interference on filling  
22    as well.   There's tight clearance between the interior  
23    of the regulator and the seat or seal material on the  
24    valve itself.

25          Q.     So Method 2 that you describe here -- first

1 of all of these three methods that you describe, are  
2 any of them, you know, more advisable to use than the  
3 others or these are just three different methods  
4 depending on the gas system? Sorry, strike that.

5 Are you opining that any of these  
6 methods are better than any of the others or is one  
7 worse than the others?

8 MS. FAPPIANO: Objection, form.

9 A. My opinion on these is really based on my  
10 interpretation of, one, the design of the valve and  
11 what is possible for it to be used, as well as the  
12 testimony from Brian Scott relative to -- in  
13 combination Brian Scott and the statements of  
14 Chris Faust at OSHA as far as how it was being done.  
15 So from that I tried to kind of extrapolate the  
16 different discussions that were had as far as whether  
17 or not the wet valve adapter was in place or not at  
18 the time of the filling and it was somehow knocked off  
19 or based on the statement of Chris Faust to OSHA that  
20 there was a depression of the valve right before -- or  
21 the disk right before there was the explosion.

22 So it's really not -- nothing  
23 preferential at least based on what I've stated  
24 here. It's merely three different methods that  
25 could be used.

1           Q.     (By Mr. Kirkpatrick) Is it your  
2 understanding that the wet valve was knocked off?

3           A.     The adapter?

4           Q.     Yeah.

5           A.     I don't see an indication that it was, no.

6           Q.     In describing Method 3 you note that -- I'm  
7 quoting at the very top of page 5: "Geometry of the  
8 valve interior is such that applied pressures of  
9 approximately 450-psi would be required to obtain an  
10 internal cylinder pressure of 2500 psi." My question  
11 is: What is the basis for your understanding of the  
12 geometry of the valve interior?

13          A.     Well, that's -- that's based on actual  
14 disassembly and measuring of the internal components  
15 because that's one of the trails I went down. If  
16 there's a reason why Chris Faust would have set the  
17 regulator pressure to 450-psi, what is the  
18 justification for that. And in doing the analysis of  
19 the geometry, not considering the strength of the  
20 spring that holds, kind of, the poppet closed, the  
21 cross-sectional area on top of the poppet is about  
22 half of the cross-sectional area on the inside of the  
23 cylinder. So once you have pressure in the cylinder  
24 it's applying a force that requires essentially a  
25 doubling of the pressure on the inlet in order to open

1     that -- that poppet and apply that pressure into the  
2     cylinder.

3           Q.     Okay. And is that typically the way for a  
4     valve interior to be designed?

5           MS. FAPPIANO: Objection to form.

6           A.     I don't know if there is a typical way for a  
7     valve to be designed. Again it depends on  
8     application. In this -- in this instance the --  
9     having a larger interior cross-section allows you to  
10    essentially pressure the container to help keep the  
11    cylinder closed or the valve closed. So from that  
12    standpoint that is not necessarily unusual for that  
13    purpose. A lot of the times you do have applications  
14    where you want it. The pressure that's present is to  
15    help you either open or to close a valve. In this  
16    case the pressure helps keep the valve closed because  
17    of that geometry.

18          Q.     (By Mr. Kirkpatrick) Okay. You don't need  
19    to essentially apply the 450-psi if you're using  
20    Methods 1 or 2. Do I have that right?

21          A.     And that's correct.

22          Q.     And that's because you are using the  
23    recharge adapter kit, which I guess changes the  
24    geometry as the tank is being filled?

25          A.     No. Really doesn't have anything to do with

1 the adapter kit. It has to do with the depression of  
2 the disk, which can either occur by having the wet  
3 valve adapter in place and applying pressure, which  
4 then, of course, takes other piping and other pressure  
5 sources to activate it or the removal of the -- since  
6 I have a valve here, the recharge -- the wet adapter,  
7 taking this portion off, which is only really -- and  
8 Mr. Scott addresses, it's really only needed when you  
9 actually install the cylinder into the test  
10 configuration. But then there is a disk inside, if I  
11 press it the right way, and this can be depressed  
12 which accomplishes the same thing. Once you have the  
13 disk depressed, there's really no restriction to flow  
14 into the cylinder, in or out.

15 Q. Got it. That was very helpful. Thank you.  
16 I appreciate that.

17 In terms of a fill source, there are  
18 ways to recharge a cylinder without transfilling,  
19 right? You can use other means of -- strike that.

20 There are other sources for  
21 compressed air than a transfill source cylinder,  
22 right?

23 A. I mean, there's probably numerous ways that  
24 you can get compressed air or nitrogen, for that  
25 matter, to do that; but all of them are going to

1     require some type of high pressure going to a lower  
2     pressure.

3             Q.     Sure.    But you could --

4             A.     And you're going to be using some type of  
5     regulator to do that.

6             Q.     So you could use an air compressor, for  
7     example?

8             A.     Well, you can.    But, again, you have to have  
9     a regulator -- one, it has to be able to -- a lot of  
10    air compressors -- the standard air compressor  
11    generally won't get you to 225-psi.   I mean, it has to  
12    be more of an industrial application, which, of  
13    course, is the whole purpose of the Poseidon.   It  
14    gives you that, plus it gives you what an air  
15    compressor can't do on its own and that is dry air  
16    because of the different filtering processes that are  
17    present in scrubbers in the Poseidon.   You know, in  
18    fact, it's a very common system that is used, at least  
19    even almost recommended to a certain degree by NFPA,  
20    for a pressure source of dry air because it's very  
21    complicated.   You don't want to be putting wet --  
22    there's a lot of humidity in the air, can be depending  
23    where you are, particularly down in Houston.   So if  
24    you just compress that air, you end up with water in  
25    the container.   And certainly for dry powder systems

1 and for even wet, you don't really want to contaminate  
2 that with water. So NFPA makes a recommendation of  
3 the typical compressor system up to like 5,000-psi to  
4 facilitate that drying purpose. So, I mean, to say  
5 that, yeah, you could go get some other compressor,  
6 it's a pretty complicated process just in general to  
7 do that.

8 Q. Okay. In terms of the dry air advantages  
9 that you just discussed, you wouldn't need dry air to  
10 put room air or nitrogen into a test tank for use in  
11 that application, right?

12 A. If that's your only application of that  
13 particular supply of air, whatever it may be, no. You  
14 just have to have a source capable of getting you to  
15 225- or 250-psi.

16 Q. Okay.

17 A. Which is pretty high pressure for a  
18 compressor.

19 Q. Okay. Do you agree that compressed gas  
20 systems have to be designed by individuals that are  
21 competent in designing those systems?

22 MS. FAPPIANO: Objection, form.

23 A. I guess it depends on what portion of the  
24 system you're talking about.

25 Q. (By Mr. Kirkpatrick) Is there portions of

1 compressed air systems that can be designed by  
2 individuals who are not competent in designing that  
3 portion?

4 MS. FAPPIANO: Objection to form.

5 A. Well, when it comes to design, design or  
6 application, it's -- I don't think you necessarily  
7 have to be competent in design to put component parts  
8 that work together together. You have to be competent  
9 in design if you are designing a compressor and all  
10 the interworkings of that piping and the cylinders and  
11 regulators and things like that. But if it's a matter  
12 of I need a system that does -- that takes me from  
13 5,000-psi and I want to be able to use it in  
14 applications for output pressure for anywhere between  
15 50 and 5,000-psi, you can -- you can specify those  
16 components, and somebody that may not be competent in  
17 design can put those components together.

18 Q. (By Mr. Kirkpatrick) In terms of what  
19 Oprandy did here, which is what I mean by designing  
20 a compressed air system, do you believe that you  
21 have to be competent in the design of compressed air  
22 system to do what Oprandy did?

23 MS. FAPPIANO: Objection, form.

24 A. My understanding of the system is such that  
25 it had the capabilities of doing exactly what was



1 necessary in this case to properly fill test cylinders  
2 as well as STBA cylinders.

3 Q. (By Mr. Kirkpatrick) Well, that wasn't  
4 quite my question. It's just more generally whether  
5 the type of system that was set up by Oprandy,  
6 whether the person who designed that system must be  
7 competent in designing compressed air systems?

8 MS. FAPPIANO: Objection to form.

9 A. Well, I think I answered that in the sense  
10 of the compressor system itself with the cascade  
11 cylinders and the regulator, the hose interconnecting  
12 and the outlet, those hoses are all designed  
13 appropriately for the system. So I don't know where  
14 you need a designer in order to use -- whether you  
15 have to be competent in design in order to use that  
16 system. I think you have to be competent in  
17 understanding, you know, the limitations of the  
18 application of that system. You need to be able to  
19 understand what a particular cylinder's maximum  
20 working pressure is and adjust the regulator  
21 accordingly for that use.

22 Q. (By Mr. Kirkpatrick) But in terms of the  
23 design of the system itself, you don't think that  
24 requires any particular expertise in compressed air  
25 system design?

1           A.     Well --

2                   MS. FAPPIANO:  Objection to form.

3           A.     -- I would say or hope that the company that  
4     designed the Poseidon system, the compressor system,  
5     was competent in their design.

6           Q.     (By Mr. Kirkpatrick) So what I'm hearing  
7     is, no, that compressed gas system does not need to  
8     be designed by individuals competent in the  
9     designing those systems?

10           MS. FAPPIANO:  Objection, that misstates the  
11     testimony.

12           A.     I don't think you're hearing me right.  The  
13     designer and manufacturer of the system; that is, the  
14     compressor as well as the regulator, the hoses  
15     everything, should be engineered and designed to be  
16     appropriate for handling the pressures that the system  
17     can produce.  And just for somebody effectively to use  
18     that system, does not have to be competent in design  
19     of that system.  They have to understand the  
20     limitations and the application and adjust  
21     accordingly, but they don't have to be competent to  
22     design the system or manufacture it for that matter.

23           Q.     (By Mr. Kirkpatrick) Got it.  Okay.  
24     Sounds good.  I was thinking you were talking design  
25     as opposed to use, that makes sense.

1                   In terms of the designing compressed  
2 gas systems, do you agree that overpressure  
3 protection is a primary consideration in making that  
4 design?

5                   MS. FAPPIANO: Objection.

6                   A. I would say that it would normally be  
7 considered in the design of both the compressor and  
8 the cylinders that are used in the cascade system such  
9 that the compressor doesn't tear itself up trying to  
10 over pressurize or rupture a cascade cylinder by the  
11 compressor trying to put too much pressure into that  
12 particular cylinder. So rupture disk and limits on  
13 pressure output would be incorporated in that design  
14 of the compressor system, yes.

15                  Q. (By Mr. Kirkpatrick) In terms of designing  
16 compressed gas systems, do you agree that in an  
17 overpressurization event, it's important to make  
18 sure that the compressed gas is discharged in the  
19 safest location in the system?

20                  MS. FAPPIANO: Objection to form.

21                  A. I'm not really sure if you've got a specific  
22 component that you're talking about or just in  
23 general. I mean, I can -- I can say that you -- you  
24 don't -- where you have a rupture disk, for example,  
25 on the pressure vessels themselves, on the valve, you

1 would have a rupture disk. You would want to have  
2 that installed in the manner that hopefully nobody is  
3 standing right in front of it when it activates or it  
4 displaces the pressure in a manner such that it is not  
5 going to produce shrapnel or debris from a ruptured  
6 disk and not injure somebody.

7 So that's a function. But there are  
8 hazards related to relief valve, and every relief  
9 valve installation is going to specify, you know,  
10 don't put your face in front of it, don't put  
11 anything over it because it could activate  
12 inadvertently.

13 Q. (By Mr. Kirkpatrick) And that's not -- you  
14 mentioned shrapnel in the rupture disk, but the  
15 release of compressed gasses themselves can be  
16 dangerous, right?

17 A. Sure. At a certain pressure you could  
18 penetrate the skin if you're in proximity to a high  
19 pressure release, yes. Well, cutting and/or  
20 penetration, sure.

21 MR. KIRKPATRICK: Why don't we, if it's okay  
22 with you, take another five minutes and come back at  
23 11:08 Central. Does that work?

24 THE WITNESS: That's fine.

25 (Recess taken)

1 MR. KIRKPATRICK: Let's go back on the  
2 record.

3 Q. (By Mr. Kirkpatrick) Turning to your  
4 report. We were just discussing -- earlier we were  
5 discussing the three methods that you described.  
6 You state that Methods 2 and 3 are safe if they are  
7 performed correctly, right?

8 A. Yes.

9 Q. But you don't in your report set forth every  
10 step required to perform those methods correctly?

11 A. No, I don't.

12 Q. And what is your understanding for --  
13 rather, what is the basis for your understanding of  
14 the proper methods to fill the tank?

15 A. Well, the primary is and the principal is  
16 make sure that the regulator output pressure from the  
17 cascade system is set appropriately.

18 Q. But in terms of the step-by-step to know the  
19 proper steps for refilling a tank, where would someone  
20 go to determine that?

21 A. Well, are you talking about this specific  
22 Tyco cylinder in general, the steps necessary, or just  
23 filling a cylinder even such as an STBA, for example?

24 Q. The latter. Just how would they know  
25 that -- these three methods that you list, where would

1     you go to get the step-by-step for those methods?

2           A.     Well, since this involves specifically a  
3     valve that is sold by Tyco, if not manufactured for  
4     Tyco, but certainly sold for this application, then I  
5     would rely on hopefully some kind of step-by-step  
6     procedures from Tyco on what their recommendations  
7     are.   Particularly, you know, in light of the fact  
8     that they provide the -- for purchase the refill  
9     adapter, for example, that is part of the refill  
10    process.   So that's -- that's at least the first place  
11    I would look for detailed instructions.

12          Q.     So if you look at the second sentence on  
13    page 5: "Accident details."   You say, "Correct  
14    operation includes placing the cylinder to be filled  
15    in one of the cylinder chambers in front of the  
16    Poseidon compressor."   So I guess my question would be  
17    in terms of the safe operations, where would you go to  
18    determine that proper operation includes placing the  
19    cylinder in the chambers?

20          A.     That's my understanding from the testimony  
21    of Mr. Scott as well as, I guess, Mr. Hawkins as far  
22    as what they would do in refilling, for example, the  
23    STBA, that would be something that they would do,  
24    place the cylinders in that orientation for protection  
25    as well as stability of the cylinder while it's being

1 filled. And so whether that's from -- I don't know  
2 exactly the source. If that's something that came  
3 from Poseidon or if that's something that they had to  
4 just incorporate in their procedures at Oprandy.

5 Q. So when you say the words "correct  
6 operation" here, you're not opining as to correct  
7 operation, you're just saying that based on your  
8 review of the records in this case that would be  
9 correct operation?

10 A. As I understand it from the testimony that  
11 I've reviewed, yes.

12 Q. You later state in your report that  
13 Mr. Faust was trained to recharge the Tyco air tanks  
14 properly. Is that an observation based on your review  
15 of the record, or is that your opinion?

16 A. Based on my review of the record. The fact  
17 that he had done that several times, numerous times  
18 and several times, in fact, the week prior and done it  
19 successfully, appropriately, that it would be my  
20 opinion that he knew the procedures to do it  
21 correctly.

22 Q. But you are not opining on, again, and I  
23 think we just went over this, what those procedures  
24 are, you're saying based on your review of the record  
25 he was given procedures and knew how to follow them?

1           A.    I do not know the step-by-step. I can --  
2    based on knowing the components and knowing from the  
3    testimony what's stated as far as how it was done, I  
4    can put something together in my mind; but I don't  
5    know specifically the steps that were specifically  
6    taught.

7           Q.    Okay. So your opinions related to Mr. Faust  
8    being provided with training and safe procedures for  
9    filling is based on his ability to fill tanks in the  
10   past?

11           MS. FAPPIANO: Objection, form.

12           A.    Well, it's based on testimony from Mr. Scott  
13    that he did teach how to fill cylinders, I believe, as  
14    well as STBAs to Mr. Faust, as well as the statement  
15    from the -- that OSHA had recorded from Mr. Faust as  
16    far as how he was doing it, indicating that he had  
17    been taught in the fact -- and combined with the fact  
18    that he had, again from testimony, successfully filled  
19    cylinders in the past.

20           Q.    (By Mr. Kirkpatrick) And your opinion --  
21    but, sorry, just to be clear, you didn't analyze the  
22    actual step-by-step that was taught to Mr. Faust?

23           MS. FAPPIANO: Objection, asked and  
24    answered.

25           A.    I have not seen or been told what that



1 step-by-step method was. So I have not been able to  
2 analyze that, no. I just know that it has -- it has  
3 worked for Mr. -- Mr. Scott and did up to the  
4 incident for Mr. Faust.

5 Q. (By Mr. Kirkpatrick) Okay. Are you aware  
6 from Mr. Scott's testimony that he testified that  
7 Mr. Faust had his own way of filling tanks?

8 A. From whose testimony?

9 Q. Mr. Scott's, Brian Scott.

10 A. I don't recall that specifically that he had  
11 his own way. I don't recall that specific line of  
12 testimony that he had his own way, no.

13 Q. And we discussed Mr. Faust. Is it your  
14 understanding that Mr. Buono was not trained in how to  
15 safely refill the test tank?

16 A. It's my understanding that he had not been  
17 trained, period, in the operation of the Poseidon  
18 equipment for either STBA or test tank, test cylinder.

19 Q. And again turning back to the three methods  
20 that you describe, is it your understanding that  
21 Mr. Faust on the date of the accident happened was  
22 attempting to use Method 3?

23 A. That's my -- my opinion based on everything  
24 I know about the case at this point.

25 Q. And when you say everything you know about

1 the case, is that primarily because he set the  
2 regulator to 450?

3 A. Well, set the regulator to 450, and I  
4 believe Mr. Buono testified about the depression of  
5 the disk at some point in that filling process.

6 Q. And it's your opinion that despite having  
7 been -- strike that.

8 It's your opinion that Mr. Faust did  
9 not follow proper filling procedures, right?

10 A. I'm sorry, can you repeat that? I lost you  
11 there for a second.

12 Q. No problem. It's your opinion that  
13 Mr. Faust did not use proper filling procedures,  
14 right?

15 A. We don't know what -- what procedures were  
16 used beyond what the statements indicate, but it is  
17 clear that at some point the pressures exceeded  
18 450-psi and, you know, thus because of that, we have a  
19 ruptured cylinder and injured employees.

20 Q. On page 7, I'm looking at Point 5, you state  
21 that Chris Faust inadvertently created a cylinder  
22 overpressure condition by not following the correct  
23 procedures. I'm just confirming that it is your  
24 opinion that he did not follow the correct procedures?

25 A. It's because we don't have -- we don't have

1 a step-by-step as you said before, of exactly what  
2 occurred between the 450 setting, if that was accurate  
3 or not, or that's what he intended or that somehow was  
4 adjusted in the process; but ultimately, yes, that's  
5 what occurred and not following correct procedures,  
6 yes.

7 Q. And as part of that he did not use the  
8 Poseidon chamber, which is part of correct procedures,  
9 right?

10 A. That's correct.

11 Q. And use of that chamber would have prevented  
12 the injuries that resulted from this accident?

13 MS. FAPPIANO: Objection to form.

14 A. It would have greatly restrained the  
15 propulsion of shrapnel from the cylinder. So, yes, it  
16 would have prevented what actually occurred.

17 Q. (By Mr. Kirkpatrick) And Mr. Faust did not  
18 correctly set the regulator to the proper outlet  
19 pressure, right?

20 A. Well, or at some point it became changed  
21 from that correct setpoint.

22 Q. You're saying that it could be that the  
23 regulator -- I mean, how could the regulator have been  
24 moved other than if he set it above the setpoint?

25 A. And that's what I'm referring to is that

1 whether he set it at the 450 initially or  
2 misinterpreted the setting or adjusted the setting to  
3 some higher point, that -- one of those occurred.

4 Q. Okay. So at some point prior to the  
5 rupture, the regulator was adjusted upward from 450?

6 A. I believe so. We just don't know when that  
7 occurred.

8 Q. Okay. And if that adjustment had not been  
9 made, then this incident would not have occurred?

10 MS. FAPPIANO: Objection to form.

11 A. If you're adding to that if it had been set  
12 at 450 or below and left at that set pressure, then  
13 that is correct.

14 Q. (By Mr. Kirkpatrick) Later in your report  
15 you say that Brian Scott preset the regulator outlet  
16 pressure. I just wanted to be clear on what you  
17 meant by that. I think this is Point 3 on page 6.

18 A. Yes. And that appears to be what  
19 Chris Faust was stating to OSHA that that's what at  
20 least -- at least the intent of what he had done was  
21 to preset the regulator.

22 Q. For Mr. Scott to do that?

23 A. Well, as far as the procedure that Mr. Scott  
24 discussed, whether he preset it when he was filling,  
25 that appeared to be the same procedure that

1 Chris Faust was describing.

2 Q. Okay. Got it. And do you agree that it was  
3 improper for Mr. Faust to be compressing a disk on the  
4 valve while the system was engaged with the tank?

5 A. At the point at which he was doing so, I  
6 would say, yes, that's -- that was inappropriate.

7 Q. And do you agree that it's best practice to  
8 close the system before doing troubleshooting like  
9 what he did?

10 A. I would agree that if the procedure that  
11 you're taught to use or you're using is not working,  
12 that that's a good practice, yes, to stop where you're  
13 at and seek assistance or start over again, something.

14 Q. Do you recall from Mr. Scott's testimony in  
15 his deposition that Chris Faust may have been  
16 distracted during the filling process?

17 A. I remember there was some discussion about  
18 that, yes.

19 Q. And do you agree that it's best practice not  
20 to be distracted while filling a cylinder?

21 MS. FAPPIANO: Note my objection.

22 A. Well, if -- if, in fact, there was some  
23 distraction, I think there is some contradiction in  
24 the testimony regarding that, depending on who you're  
25 reading; but in general terms, I think that in doing

1 something like this, you need to be focused on what  
2 you're doing. Just as we see all the time working on  
3 flammable gas matters, it requires pretty focused  
4 attention on what you're doing.

5 Q. (By Mr. Kirkpatrick) Okay. Turning back  
6 to the -- and I guess just to put a finer point on  
7 that. Do you have any opinion as to whether, in  
8 fact, Mr. Faust was distracted?

9 A. I really don't have any idea.

10 Q. Do you have any opinion on whether drugs  
11 were in any way related to the incident that occurred?

12 A. I don't have any idea or opinion on that.

13 Q. Turning back briefly to the disk that  
14 Mr. Faust had pressed down, do you agree that even if  
15 the -- so let's say that the regulator were set at  
16 450, it would be unsafe to depress that disk with the  
17 regulator set at 450?

18 A. Well, if it was set at 450, this incident  
19 would not have occurred in either event; but it would  
20 have resulted in the cylinder being overpressurized  
21 beyond it's working pressure limit of 225.

22 Q. Okay. You mention a statement from -- let's  
23 see, it's on page 5, the first full paragraph, last  
24 sentence. It's what Trooper Vetter of the New York  
25 State Police reported Mr. Faust had told him. What is

1 the significance of that statement to your report, if  
2 any?

3 A. You know, that's a -- kind of a bite of  
4 information and it's -- it's unclear as to what gauge  
5 was being discussed. So it's really just something  
6 that's out there that could be -- that there was an  
7 indication on the pressure gauge of 200, which is  
8 somewhat contradictory to some of the testimony that  
9 indicates that says the gauge wasn't moving. So I  
10 don't have a clear point where that fits into the  
11 puzzle other than the fact that it exists as a  
12 statement that was at least recalled by  
13 Trooper Vetter.

14 Q. Do you base any of your opinions on that  
15 statement?

16 A. Not anything solid, no.

17 Q. In the next paragraph you discuss OSHA. Do  
18 you disagree with any of OSHA's findings related to  
19 the rupture pressure of the cylinder?

20 A. No, I think it's consistent with I think  
21 anybody that's done an analysis on the cylinder  
22 itself, both metallurgically and just mechanical  
23 calculations, but that seems to be in the right range  
24 for rupture.

25 Q. And do you disagree with any of OSHA's

1 findings related to the pressure gauge?

2 A. I don't know if it was tested independently  
3 beyond what OSHA did, but OSHA appears to show a  
4 testing gauge side by side with pressure being applied  
5 to the gauge installed to a Tyco valve and it appears  
6 to read pretty close the 25 or at least consistent  
7 between the two gauges.

8 Q. And then you discuss in the next paragraph  
9 the May 20, 2019, testing. Are there any -- you know,  
10 any conclusions from that testing that you disagree  
11 with?

12 A. No. I mean for the sake of what was being  
13 done in the test and what the test showed, I don't  
14 disagree with that, no.

15 Q. You state that the setting of the subject  
16 regulator found during testing seemed inconsistent  
17 with what Mr. Faust said and what Mr. Scott had taught  
18 Mr. Faust. By that do you just mean because it was  
19 set above 450?

20 A. Okay. You just had a real big skip there so  
21 it was -- you were just -- the setting, that's where I  
22 lost you. "The setting of the subject regulator found  
23 during testing was inconsistent," and continue on from  
24 there.

25 Q. Was inconsistent with the statement of



1 Mr. Faust and the methodology that Mr. Scott taught  
2 him. Just to clarify that's what we just talked about  
3 because it was set above 450-psi, is that --

4 A. Well, as tested, you know, there are some  
5 things that are, you know, concerning in the sense  
6 that the actual documentation of that regulator I  
7 don't think was made until Exponent was involved and  
8 marked the position and sealed the position at which  
9 they found the regulator. We don't know if anything  
10 happened to that regulator between the time of the  
11 accident and the time that Exponent acquired or  
12 documented the regulator. I'm just stating that as  
13 tested, as we received it, it certainly is not  
14 consistent.

15 Q. And you're not suggesting that anything  
16 happened with it or that it was manipulated, you're  
17 just saying we don't know; is that right?

18 A. That's the best answer is we don't know. I  
19 mean, I'm just saying we can't rule that out as a  
20 possibility that it was exactly that position. But we  
21 don't have that documented from the time of the  
22 incident until Exponent did their site inspection, as  
23 far as I know.

24 Q. Do you see any way that that incident could  
25 have occurred if the regulator were set at 450?

1           A.    No.  I guess what I'm saying in there is  
2   just to fill in that blank.

3           Q.    Sure.

4           A.    Based on the rupture of the cylinder we know  
5   the pressure had to be upwards of 1200-psi because of  
6   the setpoint of the regulator.  Like I said before, we  
7   don't know what the pressure was in those cylinders,  
8   we just know that the pressure was above 1200 and --  
9   because the regulator was set at effectively its  
10  maximum setting.  It's whatever pressure was in the  
11  cylinder was exposed.  But backtracking just to that  
12  -- what we just had a discussion about as far as where  
13  the regulator was found, at least by Exponent, we  
14  don't know if that's exactly the position it was in at  
15  the time the incident occurred.

16          Q.    Okay.

17          A.    But we do know it allowed -- whatever  
18  setting it was, it allowed at least 1200-psi.

19          Q.    Okay.  Would you -- in terms of categorizing  
20  causes in this incident, is it fair to say that this  
21  -- the cause of this incident is primarily user error  
22  by Chris Faust?

23               MS. FAPPIANO:  Objection.

24          A.    Well, I believe that the -- the  
25  overpressurization that occurred was an incorrect

1 operation -- well, the pressure that was introduced  
2 into the cylinder occurred during the attempt to fill  
3 the test cylinder by Mr. Faust.

4 Q. (By Mr. Kirkpatrick) Okay. And so I know  
5 that -- sorry to jump around, but I think you  
6 mentioned it again, when Mr. Faust compressed the  
7 disk, essentially that valve geometry you discussed  
8 that made it lower psi going into the interior of  
9 the tank goes away, right?

10 A. Well, once the valve is opened by pressing,  
11 then there is ultimately equalization between inlet  
12 and outlet that can occur. So I think what you're  
13 saying is, yeah, the geometry of the valve operation  
14 is not a factor at that point once the valve is  
15 depressed.

16 Q. And how do you -- in terms of the -- is  
17 there some kind of equation that you use or other way  
18 to determine the exact way that the valve geometry  
19 affects air going into the tank?

20 A. It's really just a ratio of the surface area  
21 of the internal seat where pressure is applied versus  
22 the surface area of the incoming or pressure source  
23 air at the top of the valve and that ratio is set just  
24 based on the design of the valve. So the equation is  
25 fairly simple. You got the surface area of the

1 internal versus the surface area of the external and  
2 they potentially will equal each other as far as force  
3 that's being applied prior to additional pressure or  
4 force being applied from the exterior.

5 Q. Moving down now to pressure gauges and  
6 pressure relief valves. You discuss incorporating a  
7 pressure relief device in the wet valve. Is it your  
8 opinion that Tyco should have incorporated a pressure  
9 relief device in the design of the test tank or that  
10 it could have done so?

11 A. It is my opinion it's at their discretion to  
12 do so since it is not required for this -- by DOT or  
13 SGA. I will leave it up in the air, though, whether  
14 or not it's required by OSHA where they seem to  
15 discuss a need for a pressure relief device; but I  
16 have not explored that to be able to give an opinion  
17 on it. It just seems to be something that's open out  
18 there. But I would leave it -- well, it was at Tyco's  
19 discretion whether or not to use a pressure relief  
20 device in this application.

21 Q. But you did not conduct an analysis of --  
22 well, I guess -- so you're saying that it would have  
23 been legal and technically possible for Tyco do this,  
24 right?

25 A. Yes.

1           Q.    But you're not saying that based on various  
2 factors that businesses consider that they should have  
3 done this?

4           A.    I'm not making that opinion that they should  
5 have, no.

6           Q.    Okay. You have an opinion as to -- well, I  
7 guess going back to your -- to the basis for your  
8 opinion that Tyco could have installed this, is your  
9 opinion based on there being no prohibition from DOT?

10          A.    I'm not aware of any prohibition from DOT.

11          Q.    What is the basis for your opinion that it  
12 was at Tyco's discretion?

13          A.    Well, it's something that is not excluded as  
14 far as I know based on the hazardous materials. There  
15 are certain solutions that DOT has because if you've  
16 got a hazardous material that upon release could, you  
17 know, poison the area or people, then they  
18 specifically exclude certain -- certain items that --  
19 where pressure relief valves would otherwise be  
20 necessary. So it's merely the size of the container  
21 that buys the exclusion in this particular case by  
22 DOT.

23          Q.    Do you have an opinion as to the particular  
24 type of pressure relief device or types that Tyco  
25 could have used?

1           A.     Well, there are many different types. I'm  
2     not sure that the application of a resettable or  
3     resealing type pressure relief makes a lot of sense.  
4     A rupture disk would probably be the most likely in  
5     this application, this kind of an emergency release.  
6     Whereas on some containers the pressure can rise and  
7     by releasing the pressure immediately, causes a  
8     reseal, such as like a liquid-propane-type  
9     application.

10                     If you can get one of those to  
11     reseal, you want it to reseal. In this application  
12     it was -- if you're pushing the limits of this  
13     cylinder, something would have to be going on that  
14     would by all means dump the pressure. So that would  
15     be a rupture disk style of a relief valve. To me  
16     that would make sense if the decision was made to  
17     put something into the valve itself.

18           Q.     But you have not in preparing your report  
19     conducted an analysis of the various types of valves  
20     and weighed the pros and cons and arrived at a  
21     recommendation of a particular type of valve or  
22     pressure relief device?

23           A.     I have not gone through each and every one  
24     and come up with a list like you stated as far as what  
25     the benefits of one over the other would be. It's

1 just -- it's -- it doesn't seem to me to meet a  
2 criteria of something that has a spring loaded, you  
3 know, reset -- resealing type relief valve.

4 Q. Okay.

5 A. That's just general. I haven't done a  
6 complete analysis, though, to answer your question.

7 Q. And do you agree that there are a lot of  
8 considerations that go into designing previous  
9 pressure relief devices?

10 MS. FAPPIANO: Objection as to form.

11 A. I think from the initial design standpoint,  
12 yes. Most have already been designed as far as the  
13 general context and accepted, you know, for the  
14 application what type to use. I mean, it would just  
15 be -- it would really be more a decision of should we  
16 or should we not use one as opposed to do we need to  
17 design our own relief valve.

18 Q. (By Mr. Kirkpatrick) And do you agree that  
19 there are a lot of factors that go into sizing  
20 pressure relief devices?

21 A. Pressure prior to failure would be a  
22 consideration, yes. And, you know, at what pressure  
23 do you want the relief valve to activate in order to  
24 eliminate damage to the container or the surrounding  
25 area. Do you want it to be replaceable, as in if it

1 does activate can we reuse the cylinder anyway and  
2 just replace the rupture disk? So, yeah, there's  
3 obviously considerations that have to be looked at.

4 Q. Would it be advisable -- well, strike that.

5 Have you ever come across a DOT 4BW  
6 style tank that has a previous pressure relief  
7 device built into the valve as you discuss in your  
8 report?

9 A. I want to say that I have in applications of  
10 something other than a fire suppression system. I  
11 can't speak to one specifically for this application  
12 where I've seen that; but, in fact, there is a  
13 requirement for 4BW once you're above a certain  
14 geometry that it has to have a relief valve installed.

15 Q. Have you come across a cylinder that has  
16 such a pressure relief device when it was not required  
17 to have one under the various regulations and industry  
18 standards?

19 A. I have seen -- this is not due to specific  
20 incidents, but I have seen a relief valve installed in  
21 various applications where I don't believe the  
22 geometry aspects of DOT require it, but for the ease  
23 of use such as in compressor -- compressor  
24 applications in fire extinguishers. In fact, some of  
25 the portable dry powder have at least what appears to



1 be a relief device built in to that application.

2 Q. And in those cases have you actually, you  
3 know, done the research and determined that it was not  
4 required; or it's just -- how do you know that one is  
5 required in those circumstances?

6 A. I'm going purely from the geometry. So it's  
7 possible that there may be. That particular design of  
8 cylinder or, you know, NFPA application, it's  
9 certainly smaller than -- than this particular  
10 cylinder and it's going to be operating at a pressure  
11 similar to, but it's an application where I believe my  
12 impression would be in the fact that you have  
13 cylinders that -- and I've seen this where you have a  
14 fire extinguisher that's involved in a fire, for  
15 example, and it will rupture. Again as we discussed  
16 earlier there are -- most of the cases for relief  
17 valves happen -- because that's a fairly common reason  
18 for cylinders to over pressurize is their exposure to  
19 fire.

20 Q. Do you agree that if a compressed gas system  
21 is set up such that it will not allow a maximum  
22 pressure greater than the rating of a particular  
23 component, then that component doesn't need a pressure  
24 relief device?

25 A. Please re -- either repeat that or restate

1 it for me, please.

2 Q. If a system is set up such that it will  
3 never allow maximum pressure to be emitted greater  
4 than the pressure rating of a particular component of  
5 that system, then that component does not need a  
6 pressure relief device?

7 MS. FAPPIANO: I'm going to object to form  
8 of that.

9 A. Well, I think that has to do with  
10 foreseeability and, you know, because under normal use  
11 applications, familiarity again with propane, under  
12 normal use you're not going to either overfill a  
13 propane cylinder or you're not going to expose it to  
14 conditions in the environment or application because  
15 of the design of the appliances and components that  
16 it's used with are never going to exceed the rating of  
17 that cylinder for the relief valve. But we see relief  
18 valves activate all the time because the application  
19 is not always as intended, or it's exposed to  
20 requirements or conditions where it's not -- people  
21 don't always follow directions, basically.

22 Q. (By Mr. Kirkpatrick) Do you agree that a  
23 calibrated gauge and pressure relief device past the  
24 ball valve of the filling system of Oprandy's would  
25 have been safer than what Mr. Faust was using?

1           A.     You're saying having a pressure relief gauge  
2     at the end of the hose?

3           Q.     If you look at the page 6 of your report you  
4     say: "Others have suggested a calibrated gauge and  
5     pressure relief device past the ball valve of the  
6     filling system would have been a safer system than  
7     what Mr. Faust was using." Do you disagree with that?

8           A.     Well, I'm not sure why you would put a  
9     relief valve in your system if that's the same system  
10    that's used for filling the STBAs because that part of  
11    the system -- that part of the system would be  
12    nonfunctional in that application. The gauge I --  
13    again if you are setting your regulator properly, then  
14    the gauge really didn't afford you any more safety as  
15    such. You know, if your pressure gauge at your  
16    regulator output is above a thousand, then, you know,  
17    that's what your gauge at the other end is. So you  
18    you've got a choice at this point which one to look at  
19    and/or -- but like I say, if you're following the --  
20    what I understand to be the prescribed way of doing  
21    this, if you set your regulator output pressure to  
22    450, then there wouldn't be a problem either. So is  
23    it safer, I guess in some degrees you might catch an  
24    improper setting at the other end of the regulator,  
25    but in general the operation is going to be the same.

1           Q.    So you don't necessarily disagree with that  
2 statement, that calibrated gauge and pressure relief  
3 device past the ball valve would have been safer?

4           A.    Well, the relief valve has to be application  
5 specific. And, again, the relief valve is used for  
6 the purpose of the system in which it's installed.  
7 The transfilling or hose or apparatus was capable of  
8 the pressures that were being exposed, and I wouldn't  
9 say -- let me put it this way, I wouldn't say that you  
10 shouldn't do that. I think the relief valve certainly  
11 limits your application. The pressure gauge, again, I  
12 wouldn't say you shouldn't do it. It's just if you  
13 follow the procedures that were supposed to be  
14 followed, it doesn't necessarily enhance the safety  
15 either.

16           Q.    We discussed in your report you say that --  
17 this is the same paragraph, "Pressure relief device  
18 installed in the cylinder valve of the Tyco test  
19 cylinder which is commonplace for compressed gas  
20 cylinders." Just to clarify you're not talking about  
21 for 4 BW cylinders in the context, you just mean  
22 cylinders generally?

23           A.    You're talking about the gauge?

24           Q.    No, the pressure relief device installed in  
25 the valve of the Tyco cylinder, about five lines up in

1 your -- in the last paragraph before the conclusion.

2 A. Well, I'm saying at that point -- I'm just  
3 stating in general for compressed gas cylinder a  
4 pressure relief device -- not saying that there was  
5 one, obviously; but that it's commonplace for  
6 compressed gas cylinders to have one, yes.

7 Q. And would -- sorry, strike that.

8 And that's based on just your overall  
9 experience with compressed gas cylinders?

10 A. Yes, most compressed gas cylinders that I  
11 have exposure to do have some type of a relief device  
12 -- pressure relief device built into them, and most  
13 compressed gas cylinder are wired to have them by DOT  
14 other than those that fall under the exclusions.

15 Q. Okay. And as you note in your report the  
16 DOT, and as you just discussed, has an exclusion for  
17 cylinders with water capacity of less than a thousand  
18 pounds. Do I have that right?

19 A. You're saying the DOT, less than a thousand  
20 pounds for -- for what?

21 Q. Of water capacity. I'll ask more  
22 open-ended. Do you know what the exception that's  
23 applicable to this tank is?

24 A. It's the dimensions of the tank that make it  
25 fall into a category from my recollection.

1 Q. Okay. The category itself doesn't  
2 necessarily matter. My question is: Do you know why  
3 that exception exists? Are you just looking at your  
4 report? I just want to make sure.

5 A. It's -- I'm sorry. It's the size as well as  
6 a pressure at a particular temperature. So it is  
7 speaking somewhat to the contents.

8 Q. Okay.

9 A. So in that particular instance I think it's  
10 the amount of energy stored that it would be looking  
11 at under normal application.

12 Q. Can I ask what you're referencing just now?

13 A. It's the CFR 49 173.301.

14 Q. Okay, great.

15 A. Which I think I reference.

16 Q. Yep, you do. My question is: Do you know  
17 why that -- and I should have it in front of me, too,  
18 do you know why the exceptions listed in subpart F  
19 exist? Just generally with respect to the exception  
20 we've been discussing, do you know why that exception  
21 was created?

22 A. Other than the essentially contained energy  
23 in the container, I really don't know anything beyond  
24 that as far as specifically why there's an exclusion,  
25 no.

1 Q. Were you surprised to learn that part of the  
2 reasoning was that the cost of having such a pressure  
3 relief device related to the cost of the cylinders  
4 does not justify requiring it?

5 MS. FAPPIANO: Objection.

6 A. Are you asking me if I would be surprised?  
7 I'm not sure these days what I'd be surprised of, but  
8 I would think and hope that there is a little bit more  
9 to it than just cost.

10 Q. (By Mr. Kirkpatrick) But you would not be  
11 surprised if that were a part of it?

12 MS. FAPPIANO: Objection.

13 A. I can't deny that it is. I don't have any  
14 references to go by on that.

15 MR. KIRKPATRICK: Okay. I was going to say  
16 -- so I'm going to say we should do a lunch break. I  
17 don't have that much left. So if everyone is okay  
18 with it, I would suggest we take another short  
19 five-minute break and then try to finish up. Does  
20 that sound okay?

21 THE WITNESS: I'm okay with that. Y'all are  
22 passed the lunch hour there anyway.

23 MR. KIRKPATRICK: Let's come back at 1:05  
24 then.

25 (Recess taken)

1           Q.     (By Mr. Kirkpatrick) In your report the  
2     last sentence of the last paragraph before  
3     conclusions and opinions you cite Mr. Brad James of  
4     Exponent. Is your understanding of what you say  
5     Mr. Brad James agrees to based on reviewing his  
6     report?

7           A.     Yes.

8           Q.     Is it based on anything other than what's in  
9     his report?

10          A.     No, it's not.

11          Q.     Do you agree that pressure relief devices  
12     must be sized in accordance with the specifics of a  
13     container?

14          A.     Yes, that's the idea, is to protect the  
15     container.

16          Q.     Sure. And are you aware that ASME has  
17     specific rules related to pressure relief devices?

18          A.     For ASME containers, yes.

19          Q.     And that the CGA has particular standards  
20     related to pressure relief devices?

21          A.     Yes.

22          Q.     And that NFPA rules also have rules related  
23     to pressure relief devices?

24          A.     They do.

25          Q.     And, for example, NFPA 55 has a maximum flow



1 rates for pressure relief devices?

2 A. Okay.

3 Q. Are you aware of that or were you previously  
4 aware of that?

5 A. Well, I mean, as far as the general design  
6 of pressure relief devices where there's concern of  
7 the size of the vessel and pressure contained in the  
8 vessel and the availability to release that pressure  
9 to prevent a catastrophic incident from happening.  
10 And most prescriptions for relief devices don't  
11 necessarily have a maximum flow rate. It's just --  
12 it's going to be depending on the type of device.  
13 It's going to be whatever the pressure is that the  
14 rupture disk or whatever the device is opens, based on  
15 its throat diameter and pressure, you're going to have  
16 a particular flow.

17 Q. Okay. So if I understood that correctly, to  
18 be effective a pressure relief device has to have a  
19 certain minimum flow capacity?

20 A. It would have a minimum, certainly.

21 Q. Yeah. And are you familiar with  
22 requirements for maximum flow capacity?

23 A. No.

24 Q. Okay. Now, discussing minimum flow capacity  
25 requirements, can you just explain why those minimum

1 requirements exist.

2 A. Generally the surface area of the container  
3 related to the volume of the container and pressure,  
4 you have to be able to release a certain amount of  
5 content to prevent the rupture of the container in a  
6 given time. It also depends somewhat on the contents  
7 of the material -- sorry, the contents itself and what  
8 that content does upon release of a product.

9 For example, again, hate to go back  
10 to propane; but when you release propane vapor, you  
11 boil the liquid propane, which actually cools the  
12 container. That's why in that application a  
13 resettable type relief valve makes sense, where if  
14 you've got a container such as any of the higher  
15 pressure cylinders of air and whatnot, a lot of  
16 times it's a rupture disk such as in a -- that would  
17 be present in the -- in that cascade system, for  
18 example, in the Poseidon. Those types of cylinders  
19 would have a rupture disk application.

20 Q. And to determine the minimum flow rate  
21 capacity for a pressure relief device, there are  
22 formulas set. For example, CGA has promulgated that  
23 manufacturers can use; is that right?

24 A. Sure. It all goes back to, you know, what I  
25 stated, it's kind of the diameter of the opening at

1     which the flow is going to occur, the pressure at  
2     which it's designed to operate at and then you've got  
3     your flow dynamics that are essentially defined  
4     releasing -- assuming the release atmosphere of what  
5     the maximum flow rate or minimum flow rate will be.

6           Q.     And is it your understanding that the --  
7     rather I'll ask: Are you familiar with ASME PTC 25  
8     which is entitled: "Pressure Relief Devices  
9     Performance Test Codes"?

10          A.     I'm not -- not off the -- not off the cuff,  
11     I'm not that familiar with that. Again that's going  
12     to be for an ASME application, right?

13          Q.     Would you be surprised that standard is  
14     incorporated into the CGA standard?

15          A.     I'm sure they incorporate UL standards as  
16     well. I mean, that doesn't surprise me; but again it  
17     depends on the application.

18          Q.     Well, I guess what I'm getting at, there are  
19     entire standards out there for evaluating the  
20     effectiveness of pressure relief devices?

21          A.     Yes. And that goes into making a  
22     determination of which ones would go into a particular  
23     application.

24          Q.     Okay. And you did not analyze all the  
25     various standards and publications related to

1 effectiveness of pressure relief devices in forming  
2 your opinions in the case?

3 A. That really wasn't my intent or purpose in  
4 this case to do so.

5 Q. So you did not analyze what flow rate would  
6 be required to have a pressure relief device on the  
7 test tank in this case?

8 A. I did not go through that -- through that  
9 exercise, no, I did not.

10 Q. So, now turning to the conclusions and  
11 opinions section, a lot of this we have covered  
12 before. So I will be brief, or I'll try to be at  
13 least, famous last words.

14 You discussed your methodology in the  
15 -- you said it kind of varies depending on what data  
16 you were provided. What was your methodology in  
17 this case?

18 A. Well, really it was a -- to the best of my  
19 ability with the material that I had, a scientific  
20 method of going through and determining from the  
21 various statements, reports, deposition testimony,  
22 determining what -- what most likely occurred in this  
23 particular instance as well as, you know, analyzing  
24 the valve to understand its operating characteristics,  
25 which I'm not aware of anybody else speaking to that.

1 So... but taking that all into consideration  
2 determining what actually occurred through scientific  
3 method.

4 Q. And was your methodology the same with  
5 respect to all seven conclusions and opinions?

6 A. As it can be applied, yeah. Some of it is  
7 more of a conclusion as opposed to an opinion, which  
8 conclusions is going to be just pure factual based  
9 such as No. 4.

10 Q. Sure. Okay. In terms of No. 3 -- or rather  
11 No. 6 you say: "A pressure relief device designed at  
12 Tyco would have prevented this accident." Above you  
13 state it "likely would have prevented this accident."  
14 So my question is just: Is your level of confidence  
15 in this opinion different than what you state in the  
16 body of your report?

17 A. I think the problem is taking into  
18 consideration some of the issues that you talked  
19 about. It would be what's feasible to be done and  
20 what the pressure setting on that device would have  
21 been. You know, for example, the -- just speaking off  
22 the cuff a little bit, which I don't really like to do  
23 in a deposition; but, for example, the relief valve on  
24 this container probably would have been set somewhere  
25 under 400-psi, whatever relief valve device it would

1 have been, just based on its working pressure, you  
2 know, somewhere in that neighborhood. So based on  
3 what we know the cylinder didn't rupture initially  
4 upon pressure application, but that relief valve would  
5 have activated and that would have been an indication  
6 there was absolutely a problem of what's going on.  
7 There wouldn't have been any further procedure  
8 depressing the disk at that point. I'm talking this  
9 incident specifically.

10 Q. Okay. And you said, you know, there is  
11 feasibility considerations and pressure settings and  
12 you did not conduct that analysis, hence you say  
13 "likely" as opposed to, you know, "certainly" would  
14 have prevented this?

15 A. In the body I did.

16 Q. And did you conduct any kind of economic  
17 analysis as to how adding a pressure relief device  
18 would have effected the cost of the tank?

19 A. I did not conduct an economic analysis, no.

20 Q. Have you ever -- and you've never worked for  
21 Tyco, have you?

22 A. No.

23 Q. Or Pyrochem?

24 A. No, I have not.

25 Q. And I mean in the context of either

1 consulting or as a company.

2 A. Tyco is a pretty big company. So we may  
3 have been involved peripherally at some point through  
4 some of their products.

5 Q. So in No. 7 you say that Tyco made the  
6 decision not to include a pressure relief device.  
7 You're not offering an opinion about -- the analysis  
8 or reasoning that went into that decision, are you?

9 A. I am not. I'm just basically stating as it  
10 states there. It was for one reason or the other they  
11 made a decision that those components -- of their  
12 system does not need one, and I'm giving you the  
13 benefit of doubt that they considered whether they  
14 should or shouldn't.

15 Q. Okay. One other thing in the -- so, sorry,  
16 jump back to the background section of your report.  
17 You state -- and I'm looking at page 1, you state that  
18 on the day of the incident Mr. Scott assigned  
19 Mr. Buono to work on preparing three new fire  
20 extinguishers for a customer and he had assigned  
21 Mr. Faust to fill an air cylinder with compressed air  
22 for a balloon test, and you cite Brian Scott's  
23 deposition. Are you aware that Mr. Buono has  
24 testified that Mr. Scott told him that Mr. Buono was  
25 to fill the air cylinder?

1           A.     I understand there's conflict in the  
2 testimony, yes.

3           Q.     And how did you resolve that conflict in  
4 favor of Mr. Scott?

5           A.     With the longevity that Mr. Buono didn't  
6 have with working there and what his task had been up  
7 to that point, it was a -- the adamant, I think, tone  
8 that Mr. Scott had about not making that assignment to  
9 him for something he had not been trained for. Also  
10 the fact that Chris Faust was there and he was the one  
11 actually doing the work and it seemed like Mr. Buono  
12 may have been just kind of standing back and looking.  
13 It did not make any sense whatsoever that he would  
14 have been given that task.

15          Q.     Were there any other -- so putting that  
16 issue aside, did you make any other credibility  
17 determinations whether of a fact witness or of an  
18 expert witness in this case?

19          A.     That's the only one I believe that -- where  
20 there was an obvious conflict in what was signed  
21 versus anything I can think of where I made that  
22 analysis and that decision.

23               MR. KIRKPATRICK:   Okay. I have no further  
24 questions for you. I really appreciate the time.

25               MR. FROMSON:   I have no questions for the



1 witness.

2 MS. FAPPIANO: I have no questions either.

3 MR. KIRKPATRICK: Thanks everybody.

4 (Deposition concluded 12:20 p.m..)

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STATE OF \_\_\_\_\_ )  
 ) : ss  
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I, DEREK NOLEN, the witness  
herein, having read the foregoing  
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do hereby certify it to be a true and  
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corrections, if any, shown on the attached  
page.

\_\_\_\_\_  
DEREK NOLEN

Sworn and subscribed to before me,  
this \_\_\_\_\_ day of \_\_\_\_\_, 2020.

\_\_\_\_\_  
Notary Public

1 UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK

2 \_\_\_\_\_ x  
FRANKLIN BUONO,  
3 Plaintiff

Civil Action No.  
7:17-cv-05915-PMH-LMS

4 v.

5 POSEIDON AIR SYSTEMS VICTORY  
AUTO STORE, INC., VICTORY AUTO  
6 STORES, INC. d/b/a POSEIDON AIR  
SYSTEMS WORTHINGTON INDUSTRIES  
7 INC., AND TYCO FIR PRODUCTS LP.  
Defendants

8 \_\_\_\_\_ x  
9 TYCO FIRE PRODUCTS LP.  
Third-Party Plaintiff,

10 v.

11 OPRANDY'S FIRE & SAFETY INC.,  
Third-Party Defendant

12 \_\_\_\_\_ x  
13  
14 REPORTER'S CERTIFICATION FOR THE  
15 ORAL ZOOM DEPOSITION OF DEREK NOLEN  
16 JULY 20, 2020  
17

18 I, Jill M. Vaughan, Certified Shorthand Reporter in  
19 and for the State of Texas, hereby certify pursuant to  
20 the Federal Rules and/or agreement of the parties present  
21 to the following:

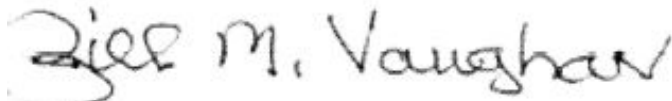
22 That the witness, DEREK NOLEN, was duly sworn by the  
23 officer and that the transcript of the oral deposition is  
24 a true record of the testimony given by the witness;

25 That the deposition transcript was duly submitted on

1 \_\_\_\_\_ to the witness or to the attorney for  
2 the witness for examination, signature, and return to  
3 Veritext by \_\_\_\_\_.

4 I further certify that I am neither counsel for,  
5 related to, nor employed by any of the parties in the  
6 action in which this proceeding was taken, and further  
7 that I am not financially or otherwise interested in the  
8 outcome of this action.

9 Certified to by me on this 31st day of July, 2020.

10  
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14 Jill M. Vaughan, CSR, RPR

Texas CSR 6192

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.



VERITEXT LEGAL SOLUTIONS  
COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted fashion to authenticated parties who are permitted to access the material. Our data is hosted in a Tier 4 SSAE 16 certified facility.

Veritext Legal Solutions complies with all federal and State regulations with respect to the provision of court reporting services, and maintains its neutrality and independence regardless of relationship or the financial outcome of any litigation. Veritext requires adherence to the foregoing professional and ethical standards from all of its subcontractors in their independent contractor agreements.

Inquiries about Veritext Legal Solutions' confidentiality and security policies and practices should be directed to Veritext's Client Services Associates indicated on the cover of this document or at [www.veritext.com](http://www.veritext.com).